Appendix F – Fish and Wildlife Technical Report

Fish and Wildlife Technical Report

Bonneville Power Administration
Schultz-Hanford Area Transmission Line Project

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1.0 INTRODUCTION

1.1 Bonneville Power Administration

The Bonneville Power Administration (BPA), a federal agency, owns and operates over 15,000 circuit miles of transmission lines throughout the Northwest. BPA markets power to direct service industries and to utilities that provide electricity for homes, businesses, and farms in the Pacific Northwest. BPA also uses the transmission system to provide power to other regions, such as Canada and California.

1.2 Transmission System

The BPA transmission system moves power from generation sites to major load areas. Generation sites are primarily the dams on the Columbia and Lower Snake Rivers, and major load areas are Seattle, Portland, Canada (during cold seasons), and California (during hot seasons). During spring and early summer months, the Northwest and Canada usually have an abundance of water from snowmelt in the mountains. The power generated from this water serves Northwest loads, and the surplus electricity is typically sent to southern markets, such as California.

1.3 Need for Capacity

The need for more capacity (i.e., a new transmission line) occurs during spring and early summer. The spring and early summer months are when juvenile salmon travel down rivers, and dams along the Lower Snake and Columbia Rivers (e.g., Lower Granite to Bonneville) spill large amounts of water to help transport juvenile salmon to the ocean. Spilling water over the dams causes less water to go through the turbines, and less power is generated. As a result, dams along the Mid- and Upper-Columbia River in Washington (e.g., Grand Coulee and Chief Joe) and dams in Canada (e.g., Mica and Revelstoke) generate most of the power needed during spring and early summer months. The large amount of power generated in the northern parts of the region and Canada moves south through central Washington to reach load centers, such as Portland and the Southern Intertie, which leads to California. This causes congestion on the transmission system in central Washington (north of Hanford) because there is not enough transmission capacity to move this large amount of power. BPA needs to increase transmission capacity in this area, to relieve existing constraints on the transmission system.

1.4 Proposed Action

To meet the need for new capacity, BPA is proposing to construct a new 500-kV transmission line between the Schultz Substation north of Ellensburg, Washington, and a substation near Hanford. Depending on the route alternative chosen, the project may terminate at the existing Hanford Substation, or at the proposed new Wautoma Substation located west of the Hanford Site, near Blackrock. Figure 1.4-1 shows the proposed routes.

1.5 Fish and Wildlife Resource Surveys

The purpose of this document is to identify fish and wildlife resources that may be affected by the proposed project. Fish species and habitats are discussed in Section 2, and wildlife species and habitats are addressed in Section 3. Each section describes the affected environment and assesses the impacts that are likely to occur to fish and wildlife species from construction and operation of the project.

Figure 1.4-1 General Project Map

INSERT PDF MAP FILE “segmntv2.pdf” or updated version showing Bsouth if available

2.0 FISH

2.1 Fish Affected Environment

This section discusses the fish habitats and species that may be affected by the proposed project. Only those streams or waterbodies with perennial flows that are affected by the project are discussed here. Some intermittent streams may have fish present at some time during the year, but usually in limited areas near a source of perennial water.

2.1.1 Study Area

The study area for the fish component of the Schultz-Hanford project includes creeks, lakes and other water bodies that may support fish along each of seven proposed line segments that make up the four possible route alternatives.

2.1.2 Methodology

The fish section was developed using field visits, literature sources, state and federal database queries, and contact with agency biologists.

2.1.2.1 Field Visits

A field visit to identify streams and ponds where suitable fish habitat might be present took place in February 2001. The proposed line segments were located in the field and the different streams and lakes that each segment passed through were identified. No fish species were observed.

2.1.2.2 Literature Sources

Journal articles, reference books, public agency management plans, agency internet sites and unpublished documents were used to determine species presence, life histories, habitat characteristics, and other information used in this section. Aerial photographs of each route, overlaid with National Wetland Inventory data were developed by the BPA and used to supplement the field visits. The WDFW catalog of Yakima basin streams and fish presence (unpublished) was used as well.

2.1.2.3 Database Queries

The US Fish and Wildlife Service (USFWS) was contacted and asked to provide a list of Threatened and Endangered fish species that might be present near the proposed project. A list of Township, Ranges and Sections within one mile of the proposed project was entered into their database. One Threatened Species (bull trout) was identified as possibly occurring near the proposed project.

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species Program was contacted and asked to provide a map of state Threatened and Endangered fish

species that might be present near the proposed project. The same area was input into this database as for the USFWS database query. The National Marine Fish Service website (NMFS, 2001) was referenced to determine threatened or endangered anadromous salmonid presence. Two endangered stocks (Upper Columbia River Spring Chinook salmon and Upper Columbia River Steelhead trout) and one threatened stock (Middle Columbia River Steelhead trout) were identified.

2.1.2.4 Agency Contacts

Agency biologists from the WDFW were contacted regarding the presence of threatened or endangered fish species along the proposed route segments. A meeting was also held in Yakima with representatives from WDFW that identified a number of areas where fish species were known to exist.

2.1.3 Regulations and Management Plans

A number of Federal acts and management plans regulate impacts to fish from projects such as that proposed here. Section 7 of the Endangered Species Act of 1972 (as amended) requires federal agencies to ensure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat. In practical terms, this means that projects that have federal involvement must consult with USFWS and/or NMFS to determine if their actions will cause a "take" of a species listed (or proposed for listing) under the act. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

A management plan has been developed for the YTC that affects fish resources. The YTC management plan states that the following measures (relevant to the proposed project) will be taken to protect fish habitat and resources on the YTC grounds:

Protection

- Protection of soils to improve percolation and reduce overland flow
  -Protection of groundwater infiltration areas
  -Erosion control structures on roads
  -Enhancement of upland vegetation
- Protection and enhancement of riparian areas
  -Bank stabilization
  -Riparian plantings
- Stream channel bed control
  -Gabion weirs
  -Boulder clusters
  -Large woody debris
  -Beavers
  -Stormwater detention facilities
  -Maintenance of hardened crossings and culverts to ensure fish passage

Maintenance

- Large woody debris placement

- Log/rock weir construction
- Boulder cluster placement
- Riparian plantings (large woody debris recruitment)
- Beaver introductions (at later date)
- Fish plantings
  -In ponds
  -In streams

Future management actions related to fish enhancement or protection on the YTC may have implications for the project, should it be constructed along the YTC alignment. Project design and construction should meet these management objectives for construction in the YTC.

2.1.4 Regional Context

The study area lies at the western edge of the Interior Columbia Basin. The area lies in the rain shadow of the Cascade Mountain, and thus receives very little precipitation (6 inches in the eastern lowest areas to 22 inches in the higher elevations in the west). Much of the precipitation occurs in the winter in the form of snow. With the exception of the Columbia River, which bisects the study area, water is scarce. Streams are generally small and intermittent. The northern part of the study area near Ellensburg drains into the Yakima River. The remainder of the project contains a number of local drainages that drain directly into the Columbia River.

2.2 Fish Habitats and Species

The proposed route from Schultz Substation to Hanford Substation (or proposed new Wautoma Substation) was broken into seven proposed alternative line segments (Segments A, B_{north}, B_{south}, C, D, E and F). In this section, a discussion of the fish habitats and species present along each line segment is given. Each perennial water feature is discussed. Intermittent streams or wetlands are not discussed. The most significant fish resources found within the project area are endangered anadromous salmonids such as salmon and steelhead. These fish are born and rear in small streams, then migrate down the Columbia River to the ocean. After several years in the ocean, they migrate upstream back to their native streams to spawn. Resident salmonids such as bull trout and rainbow trout are also important resources, as are a number of other cold and warm water fish species.

2.2.1 Unique Fish Habitats and Species of Each Line Segment

The following sections describe the habitats and fish species present along each line segment. Each perennial waterbody is addressed separately. The discussion of habitats present along each route was taken from personal observations, WDFW Priority Habitats and Species data, unpublished data from WDFW and conversations with agency biologists. Table 2.2-1 summarizes fish species presence by segment and perennial water body.

Table 2.2-1 Fish Species Presence

Perennial Water Name[1]	Segment Intercepting Waterbody							Fish Species Present In Waterbody[2]	Comments
	A	B_{north}	B_{south}	C	D	E	F		
Wilson Creek	X							**Chinook salmon (Federal Endangered, State Candidate)**, **Mountain sucker (State Candidate)**, Rainbow trout, Cutthroat trout, Brook Trout, Mountain whitefish, 3-Spine stickleback, Speckled dace, Longnose dace, Redside shiner, Torrent sculpin, Brook lamprey	Wilson Creek has high quality fish habitat in the project area. Chinook salmon are only present in the lowest mile of the creek, and not in the project area. Mountain suckers are probably found in the project area.
Naneum Creek	X							**Chinook salmon (Federal Endangered, State Candidate)**, **Mountain sucker (State Candidate)**, Rainbow trout, Cutthroat trout, Brook Trout, Mountain whitefish, 3-Spine stickleback, Speckled dace, Longnose dace, Redside shiner, Torrent sculpin, Brook lamprey	Naneum Creek has high quality fish habitat in the project area. Chinook salmon are only present in the lowest mile of the creek, and not in the project area. Mountain suckers are probably found in the project area.
Cave Canyon Creek	X							None	Fish habitat is present, but fish are not documented in this creek.
Schnebly Creek	X							Rainbow trout	Rainbow trout are present in the project area.
Coleman Creek	X							**Chinook salmon (Federal Endangered, State Candidate)**, **Bull trout (Federal Threatened, State Candidate)**, Rainbow Trout	Chinook salmon habitat is high quality, but limited to the lowest three miles of the stream. Bull trout have not been observed since 1970.
Cooke Canyon Creek	X							Rainbow trout, Cutthroat Trout, Brook trout	Cooke Canyon Creek is split into several small channels in the project area, which may limit the available fish habitat.
Caribou Creek	X							Rainbow trout	Caribou Creek has marginal fish habitat in the project area.
Parke Creek	X							Rainbow trout	Rainbow trout are likely present in the project area.
Middle Canyon Creek		X	X	X				Rainbow trout	Project crosses the intermittent headwaters of Middle Canyon Creek. It is unlikely that habitat in this area is utilized by fish.

Perennial Water Name[1]	Segment Intercepting Waterbody							Fish Species Present In Waterbody[2]	Comments
	A	B_{north}	B_{south}	C	D	E	F		
Johnson Creek		X	X	X				**Chinook salmon (Federal Endangered, State Candidate)**, **Steelhead trout (Federal Endangered/Threatened, State Candidate)**, Rainbow trout, 3-Spine stickleback, Prickly sculpin, Large scale sucker, Redside shiner	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Steelhead may spawn and rear in the lowest reach near the mouth. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, but fish are present.
Hanson Creek				X				**Chinook salmon (Federal Endangered, State Candidate)**, Rainbow trout, Brook trout	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, but fish are present.
Alkali Canyon Creek				X				**Chinook salmon (Federal Endangered, State Candidate)**, Rainbow trout, Brook trout	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, but fish are present.
Corral Canyon Creek				X				**Chinook Salmon (Federal Endangered, State Candidate)**	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, and fish are not present.
Cold Creek				X	X			None	Cold Creek is intermittent in the project area, and no fish are present.
Crab Creek					X	X	X	**Chinook salmon (Federal Endangered, State Candidate), Steelhead trout (Federal Endangered/Threatened, State Candidate)**, Rainbow trout, Brown trout, Various warmwater fish species	Crab Creek supports a wide variety of fish, including many of those found in the Columbia River.

Perennial Water Name[1]	Segment Intercepting Waterbody							Fish Species Present In Waterbody[2]	Comments
	A	B_{north}	B_{south}	C	D	E	F		
No Wake Lake						X		Various warmwater species	Private waterskiing lake
Nunnaly Lake							X	Rainbow trout, various warmwater species	Nunnaly Lake is stocked with Rainbow trout for sportfishing.
Saddle Mountain Lake						X		Various warmwater species	Saddle Mountain Lake is an irrigation return flow lake.
Columbia River		X	X		X	X	X	**Chinook salmon (Federal Endangered, State Candidate)**, **Steelhead trout (Federal Endangered/Threatened, State Candidate)**, **Pacific lamprey**, Brook lamprey, Various warmwater species (40 different species all together)	The Columbia River supports 44 known species of fish, and is the major migration corridor for anadromous species.

[1] Only streams or lakes that contain water year around are listed here.

[2] Fish species that may be present in the waterbody. In some cases fish may be present somewhere in the waterbody, but not where the proposed project crosses it. Bold species are federal or state listed species.

2.2.1.1 Fish Habitat and Species of Segment A

Segment A crosses eight fish-bearing streams that drain the Wenatchee Mountains north of the project area. These streams are all part of the Wilson-Naneum Creek subbasin, a part of the Yakima basin. The major fish issue facing these streams is the lack of access between the Yakima River and the headwater areas due to obstructions from irrigation and agricultural operations in the lower sections. All streams in the Wilson-Naneum subbasin are heavily diverted on the Kittitas valley floor and have been channelized into an intricate drainage/irrigation system. There are over 200 unscreened diversions in this drainage (WDFW, unpub.). The riparian zone of the valley portions of these streams is extensively impacted by grazing and other agricultural practices. In their upper reaches these streams flow through timbered canyons with good year-round flows.

2.2.1.1.1 Wilson-Naneum Creek Crossing

The Wilson-Naneum Creek complex is one of the more productive small streams in the project area. Fish species present in the Wilson-Naneum Creek complex include steelhead, spring chinook salmon, western brook lamprey, rainbow trout, cutthroat trout, brook trout, mountain whitefish, three spine stickleback, speckled dace, longnose dace, bridgelip sucker, mountain sucker, redside shiner, and torrent sculpin (WDFW, 2001). There is currently no adult anadromous salmonid or lamprey spawning in the upper part of the creek due to migration barriers downstream, but juvenile salmonids use the lower two miles as rearing habitat. At the site of the proposed crossing, there are no anadromous fish present, however the non-anadromous species mentioned above are likely to be present.

Since the proposed crossing is at the very upper edge of the Kittitas Valley, the stream at this point is relatively unaffected by irrigation withdrawals and other agricultural activities. However, the creek is listed on the 303 (d) list for temperature and fecal coliform. The habitat conditions near the proposed crossing are good, with clean substrate, good water quality and good instream flows (personal observation, 2001). The riparian zone is in good condition with mature cottonwoods and a diverse assemblage of riparian shrubs. Large woody debris recruitment potential is higher in this area than in most of the rest of the watershed due to the presence of large cottonwoods. The high quality of this particular section of Wilson and Naneum Creeks can be attested to by the fact that the area supports a number of wintering bald eagles. The bald eagles rely on the large cottonwood trees for roosting and may use the open water areas of the stream to catch fish.

2.2.1.1.2 Schnebly Creek Crossing-

Schnebly Creek is a small stream with little suitable fish habitat near the project area. In its upper reaches, the stream supports rainbow trout (WDFW, 2001a), but it is unlikely to harbor fish where the project crosses it.

2.2.1.1.3 Coleman Creek Crossing

Fish species present in Coleman Creek are similar to those in Wilson and Naneum Creeks, and include steelhead, spring chinook salmon, western brook lamprey, rainbow trout, cutthroat trout, brook trout, mountain whitefish, three spine stickleback, speckled dace, longnose dace, bridgelip sucker, mountain sucker, redside shiner, and torrent sculpin. Bull trout were last observed in 1970 (WDFW, unpub.). Coleman Creek has been channelized and diverted into Naneum Creek and no longer has its natural mouth. There is currently no adult anadromous salmonid spawning in this creek due to obstructions, but the lower 0.5 miles of Coleman Creek has some of the best salmonid rearing habitat in the northern Kittitas Valley area (WDFW unpub.).

Higher upstream, the riparian zone of the valley portions of this stream is extensively impacted by grazing and other agricultural practices. The proposed crossing of Coleman Creek is just above the Kittitas Valley floor. The stream flows through a shallow canyon with a narrow riparian area. Stream habitat is good, with clean substrates, good water quality and good year-round flows. WDFW PHS data (WDFW, 2001a) indicates that fish are present only from the mouth upstream to a point approximately two miles below where the proposed route crosses. However, Renfrow (2001), and WDFW (unpub.) indicated that the stream near the proposed crossing probably contains many of the species present lower in the system, except anadromous fish.

2.2.1.1.4 Cooke Canyon Creek Crossing

Fish species present in Cooke Canyon Creek include rainbow trout, cutthroat trout, and brook trout. No anadromous salmonids are present due to downstream obstructions (WDFW, unpub.).

The project crosses Cooke Canyon Creek at Coleman Canyon Road. The stream is divided into multiple small channels in this area. A good riparian area with large cottonwoods and willows exists upstream of Coleman Canyon Road. Downstream of the road, the riparian vegetation consists of smaller shrubs and trees. Stream flow is good in this area, although the split channels may limit available fish habitat. Stream substrate appears clean and the riparian areas are good, although livestock are present in the area upstream of the crossing. Cooke Canyon Creek is listed on the 303 (d) list for temperature, fecal coliform and dissolved oxygen. Like Coleman Creek, the WDFW PHS data (WDFW, 2001a) indicates that fish species are probably only present downstream several miles from the proposed crossing. However, Renfrow (2001) indicated that the three trout species were probably present higher in the drainage above the project area, and may be present where the proposed ROW crosses.

2.2.1.1.5 Caribou Creek Crossing

Fish species present in Caribou Creek are probably limited to rainbow trout (WDFW, 2001a, WDFW unpub.). No anadromous salmonids are present due to downstream obstructions

The project crosses Caribou Creek adjacent to a large cultivated field. The creek here is very narrow, with a marginal riparian area and low flows. Fish habitat is marginal. It is unlikely that rainbow trout are present in large numbers in this area.

2.2.1.2 Fish Habitat and Species of Segment B_{north}

The proposed project would cross two perennial drainages and the Columbia River between the northern terminus of Segment C and the Vantage Substation. The perennial drainages drain the northeastern corner of the YTC. Extensive past grazing, military maneuvers and other disturbances have caused changes in flow regimes and a general reduction in the quality of fish habitat within the two perennial drainages.

2.2.1.2.1 Middle Canyon Creek

The only fish species known to exist in Middle Canyon Creek is rainbow trout (US Army, 1996). However, the proposed route crosses the intermittent headwaters area of Middle Canyon, where suitable trout habitat, if available would only be present during the wet season.

2.2.1.2.2 Johnson Creek

Fish species present in Johnson Creek include rainbow trout, possibly steelhead, chinook salmon, 3-spine stickleback, prickly sculpin, large scale sucker, and redside shiner (US Army,1996). Chinook salmon utilize only the lower end of the creek near the Columbia River for juvenile rearing and steelhead may be present in the lower reaches (Renfrow, 2001).

Base flows in Johnson Creek are low due to an increase in storm runoff and a reduction in infiltration caused by compacted unvegetated soils from years of cattle grazing and military land uses. A general lack of riparian vegetation coupled with low base flows causes high water temperatures during the warmer months which may limit the distribution of some species, particularly salmonids.

The proposed route crosses in the middle reach of Johnson Creek, thus anadromous salmonids are unlikely to be present, although the other species known to exist in the creek are likely to be present.

2.2.1.2.3 Columbia River Crossing

The Columbia River near the project area supports populations of approximately 44 known species of fish. Chinook salmon, sockeye salmon, steelhead and Pacific lamprey use the Columbia River near the project site as a migration corridor between the ocean and areas upstream for spawning and rearing. Fish commonly pursued for sport include whitefish, small-mouth bass, sturgeon, catfish, walleye and perch. Rough fish such as squawfish, carp, suckers and shiners are also present in large numbers (US DOE, 1999).

The Wanapum dam tailrace, located directly underneath the proposed crossing, is an important fall chinook salmon spawning area (US DOE, 1999). The Columbia River is on the 303 (d) list of pH, temperature, and dissolved gas.

2.2.1.3 Fish Habitat and Species of Segment B_{south}

Proposed Segment B_{south} crosses Middle Creek and Johnson Creek, both described in the Segment B discussion.

2.2.1.4 Fish Habitat and Species of Segment C

The proposed project crosses six major drainages, all of which drain the interior of the YTC directly to the Columbia River. Fish are present in five of the six drainages crossed (no fish are present in Cold Creek). Extensive past grazing, military maneuvers and other disturbances have caused changes in flow regimes and a general reduction in the quality of fish habitat within the two perennial drainages. In recent years, severe fires have damaged riparian vegetation and reduced the amount of vegetative cover on upland areas.

2.2.1.4.1 Middle Canyon Creek

The only fish species known to exist in Middle Canyon Creek is rainbow trout (US Army, 1996). However, like Segment B_{north} and B_{south}, the proposed route crosses the intermittent headwaters area of Middle Canyon, where suitable trout habitat, if available would only be present during the wet season.

2.2.1.4.2 Johnson Creek

Fish species present in Johnson Creek include rainbow trout, possibly steelhead, chinook salmon, 3-spine stickleback, prickly sculpin, large scale sucker, and redside shiner (US Army, 1996). Chinook salmon utilize only the lower end of the creek near the Columbia River for juvenile rearing. Steelhead may be present in the lower reaches of Johnson Creek (Renfrow, 2001). The proposed route crosses in the middle reach of Johnson Creek, thus anadromous salmonids are unlikely to be present, although the other species known to exist in the creek are likely to be present.

2.2.1.4.3 Hanson Creek
Fish species present in Hanson Creek include eastern brook trout and fall chinook (US Army, 1996). Chinook salmon utilize only the lower reach of the creek near the Columbia River for juvenile rearing, and are not present near the proposed crossing.

2.2.1.4.4 Alkali Canyon
Fish species present in Alkali Canyon Creek include rainbow trout, eastern brook trout and fall chinook (US Army, 1996) . Chinook salmon utilize only the lower reach of the creek near the Columbia River for juvenile rearing, and are not present near the proposed crossing

2.2.1.4.5 Corral Canyon
The only fish species present in Corral Canyon Creek is chinook salmon. They only utilize the extreme lower reach of the creek near the Columbia River for juvenile rearing, and are not present near the proposed crossing (US Army, 1996).

2.2.1.4.6 Cold Creek
No fish are known to be present in Cold Creek.

2.2.1.5 Fish Habitat and Species of Segment D

Segment D crosses three drainages; Crab Creek, the Columbia River and Cold Creek. A series of irrigation canals and drains are crossed on the Wahluke Slope, however these are not considered fish habitat. Depending on conditions and the availability of stable flows, fish could exist temporarily in some canals, however they would most likely be introduced into the canals by humans or carried by birds from other water bodies and would not persist.

2.2.1.5.1 Crab Creek
Fish species present in Lower Crab Creek include rainbow trout, brown trout, chinook salmon, and possibly a remnant steelhead population (WDFW, 2001a, Renfrow, 2001). The proposed project crosses the extreme lower reach of Crab Creek just upstream of its confluence with the Columbia River. Lower Crab Creek could be used by a most of the 40 Columbia River fish species on a temporary basis as well. Crab Creek is listed on the 303 (d) list for pH, temperature, PCB's, and DDE.

2.2.1.5.2 Columbia River
The Columbia River near the proposed Segment D crossing contains approximately 44 species of fish. Like the Segment B crossings, chinook salmon, sockeye salmon, steelhead and Pacific lamprey use the Columbia River near the project site as a migration corridor to upstream spawning areas and for spawning and rearing. Fish commonly pursued for sport include whitefish, small-mouth bass, sturgeon, catfish, walleye and perch. Rough fish such as squawfish, carp, suckers and shiners are also present in large numbers (US DOE, 1999).

The area directly under the proposed crossing, just upstream from the Vernita Bridge, is an important spawning area for fall chinook salmon and Upper Columbia River steelhead. This area represents the northern extent of the naturally spawning Hanford Reach population of fall chinook, which is approximately 50-60% of the total fall chinook runs in the Columbia River (US DOE, 1999). The Columbia River is on the 303 (d) list of pH, temperature, and dissolved gas.

2.2.1.5.3 Cold Creek
No fish are known to be present in Cold Creek where proposed Segment D crosses it.

2.2.1.6 Fish Habitat and Species of Segment E

Segment E crosses two major drainages; Crab Creek and the Columbia River. Like Segment D, a series of irrigation canals and drains are crossed on the Wahluke Slope, however these are not considered fish habitat.

2.2.1.6.1 Crab Creek

Proposed Segment E crosses Crab Creek several hundred meters upstream of proposed Segment D. Fish habitat and species will be similar to those discussed in the Segment D section.

2.2.1.6.2 Saddle Mountain Lake

Saddle Mountain Lake contains only warmwater fish species such as yellow perch, pumpkinseed, bluegill and crappie.

2.2.1.6.3 Columbia River

The proposed route crosses the Columbia River near the middle of the Hanford Reach. The fish species and habitats are similar to the crossing described for Segment D. Important spawning areas for fall chinook and Upper Columbia River steelhead are present downstream from the proposed crossing.

2.2.1.7 Fish Habitat and Species of Segment F

Proposed Segment F crosses only two major drainages, Crab Creek and the Columbia River, and a lake.

2.2.1.7.1 Nunnaly Lake

Nunnaly Lake is a pothole lake in the Crab Creek valley. It is a high use recreational area. Rainbow trout are stocked for sport fishing purposes. Warmwater species such as, yellow perch, pumpkinseed, bluegill, and crappie may be present.

2.2.1.7.2 Crab Creek

Proposed Segment E crosses Crab Creek several hundred meters upstream of proposed Segment D and E. Fish habitat and species will be similar to those discussed in the Segment D section.

2.2.1.7.3 Columbia River

The proposed Segment F crossing of the Columbia River uses the same alignment as proposed Segment E, and has similar fish habitat and species to that discussed in Segment D.

2.2.2 Threatened and Endangered Fish Species

The project area is within the range of three species (which includes three Evolutionarily Significant Units, or ESU's and one Distinct Populations Segment, or DPS) of threatened or endangered fish: Upper Columbia River spring-run chinook salmon, Upper Columbia River steelhead, Middle Columbia River steelhead, and bull trout.

2.2.2.1 Chinook Salmon (Upper Columbia River Spring-Run ESU)

The proposed project area is located within the ESU of the Upper Columbia River spring-run chinook salmon, a federally listed Endangered Species. Critical habitat for this ESU includes all river reaches accessible in Columbia River tributaries between Rock Island Dam and Chief Joseph Dam in Washington, excluding the Okanogan River. Also included is the Columbia River from the mouth upstream to Chief Joseph dam (and adjacent riparian zones and estuarine areas). These fish exhibit a "stream-type" life history, meaning that the juveniles spend a year or more in the freshwater streams they were born in, as opposed to "ocean-type" chinook, which migrate to the ocean or estuaries shortly after emerging from the gravel (Myers, et. al., 1998).

The Upper Columbia River spring-run chinook spawn across a geographic area that encompasses several diverse ecosystems. Fish ascend to the upper reaches of the river systems, and in some cases, access to these areas is only possible during the high spring river flows from snowmelt and spring storms. The use of smaller tributaries for spawning and extended juvenile rearing by stream-type chinook salmon increases the potential for disturbance from human activities.

Human activities have significantly influenced the distribution of the Upper Columbia River spring-run chinook salmon. When Grand Coulee Dam was constructed, a significant area of spawning and rearing habitat was permanently blocked. Fish that were originally bound for points above the dam were transferred to other rivers such as the Methow, Entiat, and Wenatchee Rivers, which had their own distinct stocks. The unique traits of the native stocks were diluted by the addition of the new stocks, and the continued hatchery supplementation of those stocks (Myers, et. al., 1998). The native stocks were adapted to local conditions within each river system and were better suited for those systems than were the transferred stocks. This may have contributed to the overall decline in the species. Hydroelectric dams and/or irrigation diversions affect virtually every river and stream containing Upper Columbia spring-run chinook salmon. Blockage or losses of spawning and rearing habitat, direct mortality by stranding or upstream and downstream passage injury, and changes in thermal regimes have resulted (Myers, et. al., 1998).

Spawning chinook require areas of clean gravel with good subsurface flow. If subsurface flow is adequate, chinook will spawn in areas with a wide variety of stream depths, flows and gravel sizes (Healey, 1998). Preferred spawning habitat is often at pool tailouts or medium riffles with one to three feet of fast-flowing water, probably since these areas often have good subsurface flows. Juvenile chinook salmon typically require structurally diverse habitat, including deep pools, undercut banks, rocks, large woody debris, and good vegetative cover on stream banks.

Within the proposed project area, Upper Columbia spring-run chinook will only be encountered in the Columbia River, which juveniles and adults use as a migration corridor between the ocean and the headwater streams where they spawn and rear.

2.2.2.2 Steelhead Trout (Upper Columbia River ESU)

The Upper Columbia River steelhead ESU is listed as Endangered. Critical habitat is designated to include all accessible river reaches in Columbia River tributaries upstream of the Yakima River, Washington, and downstream of Chief Joseph Dam. Also included is the Columbia River from the mouth upstream to Chief Joseph dam and its adjacent riparian zones and estuarine areas.

Upper Columbia River steelhead exist in an area that sees extremes in temperatures and precipitation. Most precipitation falls in the mountains as snow. Streamflow in this area is provided by melting snowpack, groundwater, and runoff from alpine glaciers and is thus very cold and generally not as productive as other warmer streams and rivers. Upper Columbia River steelhead have been documented spending up to seven years in freshwater before migrating to the ocean, probably due to the cold temperatures and the low stream productivity (Busby, et. al. 1996). Most steelhead in this ESU, like those of the Middle Columbia River ESU, spend two years in freshwater prior to migrating downstream to the ocean and one year in freshwater prior to spawning.

Upper Columbia River steelhead are limited by habitat blockages from Chief Joseph and Grand Coulee Dams, and smaller dams on tributary rivers. Irrigation diversions and hydroelectric dams, and degraded riparian and instream habitat from urbanization and livestock grazing have resulted in severe impacts to steelhead habitat. Hatchery fish that escape to naturally spawn are widespread and outnumber native fish in several major river systems. This ESU might not exist today if there were not hatchery production. However, the unique traits of the original native stocks have been diluted by the addition of stocks that originally spawned and reared above Chief Joseph and Grand Coulee dams before they were constructed, and the continued hatchery supplementation of the original native stocks (Busby, et. al., 1996). The original native stocks were adapted to local conditions within each river system and were better suited for those systems than were the transferred stocks. This dilution of the native stocks with outside stocks less suited for local conditions may have contributed to the decline in the native populations of Upper Columbia River steelhead

Steelhead typically spawn in streams with well oxygenated areas of small and medium sized gravels free of fine sediment deposition. Juvenile steelhead typically require structurally diverse habitat, including deep pools, undercut banks, large woody debris, refuges from high flows such as off channel habitat, and areas of groundwater upwelling.

The project may affect Upper Columbia River steelhead or designated critical habitat where it crosses the Columbia River on Segments B_{north}, B_{south}, D, E, and F, or small tributaries on the Yakima Training Center along Segment C. Upper Columbia River steelhead are known to spawn in the Hanford Reach of the Columbia River near where Segments D, E and F cross (USDOE, 2001).

2.2.2.3 Steelhead Trout (Middle Columbia River ESU)

The Middle Columbia River steelhead is listed as Threatened. Critical habitat is designated to include all accessible river reaches in Columbia River tributaries (except the Snake River) between Mosier Creek in Oregon and the Yakima River in Washington (including the Yakima River). Also included is the Columbia River from the mouth upstream to the Yakima River and its adjacent riparian zones and estuarine areas.

Middle Columbia River steelhead exist in some of the driest areas of the Pacific Northwest. Vegetation in this region is generally shrub-steppe. Streams and rivers in the area are often subject to low flows and high temperatures, thus minor changes in vegetation or water quality can cause habitat degradation. Since most middle Columbia River steelhead spend two years in freshwater before migrating to the ocean, and a year in freshwater after returning from the ocean but before spawning, they may be more sensitive to changes in water quality and habitat than other anadromous species that spend less time in freshwater. Middle Columbia River

steelhead may be limited by high summer and low winter temperatures in many streams in this region. Low flows, extreme temperature conditions, water withdrawals and overgrazing have seriously impacted available fish habitat in this ESU (Busby, et. al., 1996). There is little or no late summer flow in sections of the lower Umatilla and Walla Walla Rivers. Riparian vegetation is heavily impacted by overgrazing and other agricultural practices, timber harvest, road building, and channelization. Instream habitat is also affected by these same factors, as well as by past gold dredging and severe sedimentation due to poor land management practices. A major present threat to genetic integrity for steelhead in this ESU comes from past and present hatchery practices. (Busby, et. al., 1996)

Steelhead typically spawn in streams with well oxygenated areas of small and medium sized gravels free of fine sediment deposition. Juvenile steelhead typically require structurally diverse habitat, including deep pools, undercut banks, large woody debris, refuges from high flows such as off channel habitat, and areas of groundwater upwelling.

The project may affect Middle Columbia River steelhead or designated critical habitat in small tributaries of the Yakima River north and east of Ellensburg, along Segment A.

2.2.2.4 Bull Trout (Columbia River Basin DPS)

The proposed project area is located within Columbia River Basin DPS for bull trout. The Columbia River Basin Bull Trout DPS includes all naturally spawning populations in the Columbia River Basin within the United States and its tributaries, excluding bull trout found in the Jarbidge River, Nevada. Bull trout in the Columbia River Basin DPS are a federal threatened species.

Bull trout were once widely distributed throughout the Pacific Northwest, but they have been reduced to approximately 44 percent of their historic range (ICBEMP 1997). Bull trout have more specific habitat requirements in comparison to other salmonids and are most often associated with clear and cold headwater streams and rivers with undisturbed habitat and diverse cover and structure.

Key factors in the decline of bull trout populations include harvest by anglers, impacts to watershed biological integrity, and the isolation and fragmentation of populations. Changes in sediment delivery (particularly to spawning areas), aggradation and scouring, shading (high water temperature), water quality and low hydrologic cycles adversely affect bull trout. Therefore, impacted watersheds are negatively associated with current populations. Additionally, the bull trout appear to be negatively affected by other non-native trout species through competition and hybridization (ICBEMP 1997).

Bull trout spawning and rearing is restricted to relatively pristine cold streams, often within the headwater reaches (Rieman and McIntyre 1993), although adults can reside in lakes or reservoirs and in coastal areas, they can migrate to saltwater (63 FR 31647). Bull trout distribution is patchy within watersheds, most likely due to the need for cold water (63 FR 31648). Juveniles are usually located in shallow backwater or side channels areas, while older individuals are often found in deeper water pools sheltered by large organic debris, vegetation, or undercut banks (63 FR 31467). Water temperature is a critical factor for bull trout, and areas where water temperature exceeds 15 degrees Celsius (59 degrees Fahrenheit) are thought to limit distribution (Rieman and McIntyre 1993).

The project may affect bull trout or designated critical habitat in small tributaries of the Yakima River north and east of Ellensburg, along Segment A.

2.3 Impacts to Fish Species

Impacts to fish species and habitat are assessed for each alternative proposed for the project. Various segments described in Section 2.2.1 are combined to form each alternative.

2.3.1 Fish Species Impact Levels

High impacts to fish would occur when an action creates a significant adverse change in fish habitat, populations or individuals. High impacts might result from actions that:

- cause the take of a federally listed or proposed threatened or endangered fish species;
- cause a significant long-term (more than two years) adverse effect on the populations, habitat or viability of a federal or state listed fish species of concern or sensitive species, which would result in trends towards endangerment or the need for federal listing; or
- harm or kill a significant number of individuals of a common fish species at the local (stream reach or small watershed) level.

Moderate impacts to fish would occur when an action creates a moderate adverse change in fish habitat, populations or individuals. Moderate impacts might result from actions that:

- without causing a take, cause a temporary (less than two months) reduction in the quantity or quality of localized (stream reach or small watershed) aquatic resources or habitats at a time when federally listed threatened, endangered or proposed fish species are **not likely** to be present (i.e., during non-spawning or rearing times);
- cause a short-term (up to two years) localized (stream reach or small watershed) reduction in population, habitat and/or viability of a federal or state listed fish species of concern or sensitive species, without causing a trend towards endangerment and the need for federal listing; or
- harm or kill a small number of individuals of a common fish species at the local (stream reach or small watershed) level.

Low impacts to fish would occur when an action creates a minor or temporary adverse change in habitat, populations or individuals. Low impacts might result from actions that:

- cause a temporary (less than two months) localized (stream reach or small watershed) reduction in the quantity or quality of aquatic resources or habitats of state listed fish species of concern or sensitive species, without causing a trend towards endangerment and the need for federal listing; or
- cause a short-term (up to two years) disturbance or displacement of common fish species at the local (stream reach or small watershed) level.

No impacts to fish would occur when an action has no effect or fewer impacts than the low impact level on fish habitat, populations or individuals.

2.3.2 Impacts to Fish Species Common to All Action Alternatives

The construction, operation and maintenance of the proposed transmission line will impact fish populations that reside in or near the study area. The extent of impact would depend on the fish

species, its distribution, its habitat requirements and the availability of suitable habitat in and around the project area.

2.3.2.1 Construction Impacts

Short-term construction disturbances, depending on the time of year and the location, could impact various fish species by causing sedimentation, habitat and/or individual fish disturbance, or the release of hazardous materials into a waterway. The following would be potential short-term impacts:

- Damage to fish (e.g. gill abrasion, fin rot), from construction sediments entering streams;
- Soil from roads, cleared areas, excavations, stockpiles or other construction sources might enter streams and cause an increase in sediment load and/or sediment deposition in spawning gravels or fish habitat, or damage to food organisms;
- Concrete washing or dumping might allow concrete waste to enter streams and cause an increase in sediment load and local fish toxicity;
- Other construction materials (metal parts, insulators, wire ends, bolts, etc.) might enter streams and cause changes in flow or other unknown effects;
- Mechanical disturbance of fish habitat from equipment operating in, crossing, or passing streams;
- Streambank compaction and/or sloughing might reduce the streambank's ability to support vegetation, or cause sediment input or increased runoff;
- Heavy equipment moving across a stream (or repeated travel by light equipment) might cause substrate disturbance, including sediment release or substrate compaction;
- Riparian vegetation destruction or removal (this would be incidental only; planned vegetation removal for ROW and roads is a long-term impact) may cause a loss of fish habitat (cover), loss of stream shading, removal of large woody debris sources, and reduction in buffer capacity;
- Disturbance of individual fish from equipment operating in or near streams;
- Vibration or shock from equipment operating in or near streams would drive fish to less suitable habitat or to areas where predation is more likely. In marginal conditions such as extreme low flows and high water temperatures, stress from repeated disturbance may cause death;
- Mechanical injury or death from equipment crossing or operating in streams could result, especially to fish that live in or on the bottom of the stream (such as sculpins);
- Injury or death of fish or their prey from hazardous materials spills; or
- Petroleum fuel products, hydraulic oil, and other hazardous materials typically associated with construction activities may enter the stream, causing fish kills, aquatic invertebrate kills, and death or injury to a number of other species that fish depend on for food. Spills may also create pollution "barriers" to fish migration between stream reaches.

Depending on the location and the fish species present, short-term impacts would range from low to high. Short-term disturbances such as those listed above would constitute a high or

medium impact on most species. However, since most of the project construction will occur away from streams and include mitigation (such as construction timing restrictions and spill prevention and erosion measures), short-term construction-related disturbances should result in low impacts to all fish species.

2.3.2.2 Operation and Maintenance Impacts

Long-term impacts resulting from ongoing operation and maintenance would result mostly from habitat alteration due to clearing of riparian vegetation, changes in runoff and infiltration patterns (from upland vegetation clearing), sedimentation from cleared areas, and maintenance access across streams.

Since the transmission line would span narrow riparian areas or be located upslope of stream channels, little or no riparian vegetation would be removed for line clearance. Where access roads are required to cross streams, riparian vegetation may be removed. Since riparian areas are extremely important in providing stream shading and cover for fish, and are a source of large woody debris in streams, any clearing of stream-side riparian vegetation for ROW clearance or access road construction would likely cause moderate to high impacts to fish species, should they be present.

The area cleared for tower construction and access roads in upland areas could change runoff and infiltration patterns to the extent that flow regimes in creeks would be altered, especially in smaller drainages. A decrease in groundcover from vegetation removal can cause an increase in sheet flow during storm events, with correspondingly less infiltration. This can cause higher flood flows in creeks and reduce the amount of infiltrated water that can support base flows. Higher flood flows cause more erosion and deposition of fine materials, which may affect fish habitats or cause physical damage to fish through gill abrasion. Lower base flows, in areas where base flows are already low, may cause streams to dry up in some places or result in warmer water temperatures, which can cause harm or be lethal to fish.

Clearing for roads and tower sites increases the risk of sediment input due to the erosion of soil that is normally stabilized by vegetative cover. Sedimentation of streams can cause a degradation of spawning areas, by filling the interstitial spaces in spawning gravels. This reduces the flow of oxygenated water necessary for egg and alevin survival.

Creating new vehicle access across streams can cause bank compaction, repeated sediment disturbance, disturbance or physical damage to fish (if present), a conduit for sediment input, and the possible release of automotive wastes such as fuel or hydraulic oil into a stream. Stream crossings of intermittent drainages would be accomplished by constructing fords where possible. Ford construction would involve removing a portion of the streambed below grade, then backfilling it with crushed rock or other suitable rocky material to the original streambed level. Ford approaches would be stabilized with crushed rock to reduce erosion and provide an all-weather surface. Drainages that are too incised or steep to ford may be fitted with culverts or bridges to provide water and debris passage.

Perennial streams would be crossed using existing crossings, where possible. In areas where adequate crossings or alternative routes do not currently exist, bridges or culverts would be used to maintain fish passage and stream flows, while providing vehicle access. Approaches to crossings would be stabilized with crushed rock to reduce erosion and provide an all-weather

surface. Access roads would experience intense use during construction, but use should not increase much over current threshold levels once construction is complete.

Operation of the proposed project would be limited to energizing the conductors. Normal operation of the project would have no impact on fish species.

Maintenance of the project might include periodic vehicle and foot inspections, helicopter surveys, tower and line repair, ROW clearing, and other disturbances. Depending on the time of year and location, maintenance activities could impact fish species or habitat. Periodic ROW clearing will be mostly limited to riparian areas, where the impact might be high. Maintenance impacts will be similar to those impacts related to short-term construction.

2.3.3 Impacts to Fish Species Specific to Each Alternative

Impacts to fish species are assessed for each action alternative.

2.3.3.1 Alternative 1- Schultz-Hanford (Segments A, B_{north} or B_{south}, E)

2.3.3.1.1 Segment A

Segment A would cross 28 intermittent drainages and seven perennial streams, six of which are known to be fish bearing. Wilson Creek, Naneum Creek, Schnebly Creek, Coleman Creek, Cooke Canyon Creek, Caribou Creek and Parke Creek are all known to contain fish. Cave Canyon Creek does not contain fish.

Both Wilson Creek and Naneum Creek are in steep canyons. Towers would be placed high up and well away from both streams. Access would be through existing fords. Since no new construction would occur near the streams, impacts to fish are expected to be low. The increase in traffic along the existing roads would be insignificant.

Schnebly Creek has an existing crossing and Coleman Creek does not require a crossing. The towers would be constructed high up and away from the creek edges. No impacts to fish are expected.

Cooke Canyon Creek, near the proposed crossing, has several channels and lies in a wide floodplain that is mostly pasture. An existing County road provides access. Removal of riparian vegetation may be required for overhead clearance. This would create a moderate impact to rainbow trout, cutthroat trout and brook trout. With mitigation (see Section 2.4), this impact could be reduced to low.

Caribou Creek has an existing farm road ford. Towers would be located away from the creek. Impacts to fish are expected to be low.

Parke Creek has access from either side of the creek, eliminating the need for a new crossing. Towers would be located well away from both creeks. No impacts to fish are expected.

The proposed reroute of Segment A would cross Cooke Canyon Creek approximately 0.3 miles south of the original alignment in an area with very little riparian vegetation and multiple small

channels. Removal of riparian vegetation in this area would not be required, minimizing the impacts to fish.

2.3.3.1.2 Segments B_{north} and B_{south}

Segments B_{north} and B_{south} would cross five intermittent drainages, two fish-bearing perennial streams (Middle Canyon Creek and Johnson Creek), and the Columbia River, which is also fish bearing.

Middle Canyon Creek and Johnson Creek would both be crossed in their headwaters, where conditions are generally unsuitable for fish survival during most times of the year. Therefore, there would be no direct impacts to fish (injury, disturbance from equipment, etc.).

Middle Canyon Creek would need to be crossed with a ford, and the streambed would be disturbed during creation of the ford, which would have the potential to cause increased sediment input, bank destabilization and riparian vegetation removal. Also, hazardous materials spills from equipment traveling across the ford could move downstream to where fish are present, should the stream be flowing. Thus, indirect impacts to fish could be high depending on the nature and quantity of a spill and the time of year it occurs. With mitigation such as construction during work windows spill control and erosion controls, (see Section 2.4), impacts to fish in Middle Canyon Creek should be low.

Johnson Creek has an existing culvert crossing, therefore impacts to fish are expected to be low.

The Columbia River would be crossed by a long span, with towers set well away from the banks. Since the towers and access roads would be far away from the edge of the river, sediment or other materials would not be able to reach the water. Therefore, there would be no impacts to any fish species in the Columbia River along Segment B_{north} or B_{south}.

2.3.3.1.3 Segment E

Segment E crosses eight intermittent streams, four canals or drains, two lakes, one perennial stream and the Columbia River. Both lakes, the stream, and the Columbia River contain fish. Segment E would parallel Segment D from the Vantage Substation to the top of the Saddle Mountains, then head southeast into the Hanford Site.

The Crab Creek crossing would have towers placed over 200 feet from the stream bank. Access would be from either side, so no new crossings of Crab Creek are proposed. Some riparian vegetation may need to be cleared. No new construction will occur near Crab Creek, therefore impacts to fish (Chinook salmon, steelhead, rainbow trout, brown trout and warm water fish) are expected to be low.

Saddle Mountain Lake would be crossed at its eastern end, near where the overflow channel (Saddle Mountain Wasteway) exits. An existing access road crosses the wasteway and could be used for access. Towers would be placed over 200 feet from either side of the edge of the lake. Riparian vegetation is relatively low, although some trees may need to be removed for overhead access. The lake supports warm water fish only. Since no new access roads would be built, towers would be located away from the lake. No sensitive fish species are present, so impacts would be low.

The Columbia River crossing into the Hanford Site would be accessed from either side of the river. Towers would be placed well back from the edge of the river. There is very little riparian vegetation in this area and none of it would need to be cleared. There would be no impacts to fish species in the Columbia River at this location.

2.3.3.2 Alternative 1A Schultz-Hanford (Segments A, B_{north} or B_{south}, F)

Impacts to fish resources along Segments A, B_{north} and B_{south} would be the same as described for Alternative 1 (see Section 2.3.3.1.1 and 2.3.3.1.2)

Segment F would cross 30 intermittent drainages, one canal, two lakes, one perennial stream and the Columbia River. Nunnaly Lake, Crab Creek, Saddle Mountain Lake and the Columbia River all contain fish.

Segment F would use the same crossing of the Columbia River as described in Segment E, so impacts to fish would be similar to those described in that section.

Nunnally Lake is a closed depression north of Crab Creek that has been filled with water and contains rainbow trout and various warmwater fish species. It is managed as a recreational fishery. Access roads would be routed around the lake, and towers would be located on either side, over 200 feet from the edge of the lake. Since no new access roads would be constructed near the lake, towers would be placed far away from the edge. No riparian vegetation would be removed, so the impact to fish in Nunnally Lake would be low to none.

2.3.3.3 Alternative 2 Schultz-New Wautoma Substation (Segments A, B_{north} or B_{south}, D)

Impacts to fish resources along Segments A, B_{north} and B_{south} would be the same as described for Alternative 1 (see Sections 2.3.3.1.1 and 2.3.3.1.2).

Segment D crosses 11 intermittent drainages, nine canals or drains, one lake, one perennial stream and the Columbia River. No Wake Lake, Crab Creek and the Columbia River all contain fish.

No Wake Lake is a private constructed lake used for water skiing. It contains warm water species of fish. Towers may be placed close to the water, but access would be from either side. The land surrounding the lake is relatively flat, which would limit the erosion potential from tower and access road construction and limit the potential for spills to enter the lake. No impacts to fish are expected at this location.

Since Segment D would cross Crab Creek near the location where Segment E crosses, impacts would be similar to those described for Segment E (Section 2.3.3.1.3).

The proposed crossing of the Columbia River would parallel existing transmission lines. The towers would be set over 200 feet from the edge of the river, and access would be from existing roads on either side of the river. Since no new access roads near the river would be built and there is sufficient distance from the towers to the river, no sediments spills or other materials would be able to easily enter the river. Impacts are expected to be low.

2.3.3.4 Alternative 3 Schultz-New Wautoma Substation YTC Route (Segments A, C)

Impacts to fish resources along Segment A would be the same as described for Alternative 1 (see Section 2.3.3.1.1).

Segment C construction would cross 40 intermittent drainages and six perennial steams, five of which are fish bearing. Middle Canyon Creek, Johnson Creek, Hanson Creek, Alkali Canyon Creek and Corral Canyon are all known to contain fish. No fish are present in Cold Creek.

Middle Canyon Creek and Johnson Creek would be crossed with fords in their headwater sections. Impacts to fish in these two creeks would be similar to those described for Segment B (Section 2.3.3.1.2).

Hanson Creek and Alkali Canyon Creek both contain rainbow trout and brook trout throughout their lower and middle reaches. Both of these creeks and Corral Canyon Creek support chinook salmon in their very lowest reaches near the Columbia River. These creeks are in steep canyons, so the towers would be placed on either side of the canyons well above the creek. No impacts are expected from tower construction and placement. However, all three of these streams would need to have bridges or culverts placed in them to allow vehicular access. Impacts to fish, especially chinook salmon, from construction of these access roads and structures could be high, depending on when the construction occurs, if sediments or spills enter the creek, and if fish are present. With mitigation such as doing in-water work during work windows, erosion and spill control measures, and construction of structures that allow fish passage (see Section 3.4), impacts to rainbow trout, brook trout and chinook salmon would be low.

2.3.3.5 No Action Alternative

No impacts to fish resources are expected under the No Action Alternative.

2.3.4 Impacts to Threatened and Endangered Fish Species

Table 3.3-2 lists federally listed fish species that are present within the study area. A Biological Assessment is being prepared separately, which will present effects determinations for each of these species.

Table 3.3-2 Impacts to Threatened and Endangered Fish Species

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Chinook Salmon (Upper Columbia River Spring Run ESU)	FE	SC	B_{north}, B_{south}, C, D, E, F	P	Moderate	Low
Steelhead Trout (Middle Columbia River ESU)`	FT	SC	A	P	Moderate	Low

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Steelhead Trout (Upper Columbia River ESU)	FE	SC	B_{north}, B_{south}, C, D, E, F	P	Moderate	Low
Bull Trout	FT	SC	A	H	Moderate	Low
FE = Endangered SC = Candidate P = Present (general presence) FT = Threatened H = Historically Present, Not Currently Present						

2.3.4.1 Chinook Salmon (Upper Columbia River Spring Run ESU)

Upper Columbia River chinook salmon (a federally listed endangered species) are present in the study area only in the Columbia River, where line Segments B_{north}, B_{south}, D, E and F cross it and possibly in some of the lower reaches of streams crossed by Segment C. The construction and operation of Segment A would have no impact on Upper Columbia River chinook salmon, since they are not present in the Yakima River basin and the streams that these segments cross.

Construction of any of the three Columbia River crossings associated with Segments B_{north}, B_{south} D, E and F would also have no impact on Upper Columbia River chinook salmon. This is because towers would be built far enough away from the river bank and riparian areas to eliminate the potential for sediments, spills or other materials to enter the river. New towers at river crossings would parallel existing towers, which range from 200 to1,000 feet from the edge of the river. Access to the towers would be limited to the landside of the towers and would not enter the riparian zone. Riparian vegetation removal would not be required at any of the Columbia River crossings. The streams crossed by Segment C are in steep, narrow canyons and would need stream crossings constructed across them. Chinook may be present at certain times of year in the lowest reaches and could be affected by sediment and pollutants moving downstream from construction areas. Therefore, the impacts to Upper Columbia River chinook salmon could be moderate.

2.3.4.2 Steelhead Trout (Upper Columbia River ESU)

Upper Columbia River ESU steelhead (a federally listed endangered species) are present in the lower reaches of streams crossed by Segments B_{north}, B_{south} and C. They also exist in the Columbia River where Segments B_{north}, B_{south}, D, E, and F cross it.

The Columbia River crossings (described in the chinook salmon sections above) would have no impact on Upper Columbia River steelhead. Crossings of Middle Creek and Johnson Creek on Segments B_{north}, B_{south} and C would not directly impact Upper Columbia River steelhead, since this creek does not support steelhead where these proposed segments cross it. However, the lower reach of Middle and Johnson Creeks may support steelhead, and moderate to high indirect impacts could occur from sediments, spills or other materials entering the creek, or removal of upland and riparian vegetation that might change flow regimes and increase stream temperatures. The area of Crab Creek where Segments D, E and F cross it may support steelhead, however the construction of towers and access roads would not occur within 200 feet

of Crab Creek, and no riparian vegetation would be removed. With mitigation (see Section 3.4), impacts to Upper Columbia River steelhead are expected to be low.

2.3.4.3 Steelhead Trout (Middle Columbia River ESU)

Middle Columbia River ESU steelhead (a federally listed threatened species) are present in the Yakima River basin, but are not known to exist in the upper reaches of streams where Segment A crosses. However, these streams are federal designated critical habitat.

Construction near streams along Segment A could cause sediments or other materials to enter the streams and have minor impacts to water quality. This would cause moderate impacts to Middle Columbia River steelhead. However, with mitigation (see Section 3.4), impacts to Middle Columbia River Steelhead are expected to be low.

2.3.4.4 Bull Trout Columbia River DPS

Bull trout (a federally listed threatened species) are not known to currently exist within any of the streams, lakes or rivers crossed by the project, although all streams and rivers are designated as critical habitat. Coleman Creek, near Ellensburg, is known to have historically contained bull trout, but none have been observed since 1970 and it is unknown whether any are still present. No historical records of bull trout are documented in any of the other proposed stream crossings. No new access roads would be constructed across Coleman Creek and the towers would be placed well away from the creek. Since construction would occur far from the creek, and no sediments, spills or other materials would be likely to enter the creek, the project would have no impact on bull trout.

2.3.5 Impacts to Special Status Wildlife Species

Table 3.3-2 lists state and federal special status species that USFWS and WDFW have identified as possibly occurring within the project area and indicates the possible impact the project may have on them.

Table 3.3-3 Impacts to Special Status Fish Species

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Coastal Cutthroat Trout	FP		None	N	None	None
Westslope Cutthroat Trout	FSC		A	P	Moderate	Low
Interior Redband Trout (Rainbow)	FSC		All Segments	P	High	Low
Margined Sculpin	FSC	SS	None	N	None	None
Pacific Lamprey	FSC		B_{north}, B_{south}, D, E, F	P	Low	None
River Lamprey	FSC	SC	A	P	Low	None

Federal Status
FP = Proposed for Listing
FSC = Species of Concern

State Status
SC = Candidate
SS = Sensitive

Presence
P = Present (general presence)
N = Not Present

2.3.6 Cumulative Impacts to Fish Species

The proposed action may contribute to localized, short-term and long-term disturbance to fish resources, because of increased sediment input and possible hazardous materials spills. Erosion and sedimentation of streams within the study area has increased over the past 100 years due to land use practices such as grazing, agriculture, road building, land clearing, military operations and other disturbances. This has contributed to a reduction in the quality and availability of fish habitat in many streams. Increased access and human activity around streams during this time period has also increased the frequency of hazardous material spills entering streams. While spill events are relatively rare and generally confined to a single stream or stream reach, their effects can be devastating to fish resources.

Riparian vegetation has been significantly reduced from historic levels in Washington and much of the remaining habitat is heavily disturbed by grazing, fire, and other land uses. Small areas of riparian habitat would be lost because of the proposed project, adding cumulatively to the existing degradation of habitat.

Overall, with mitigation, the project is unlikely to cause significant long-term impacts to fish. However, even small impacts may contribute cumulatively to further degradation of fish habitat and species health.

2.4 Recommended Fish Species Mitigation Measures

The following mitigation measures would be implemented in order to reduce or eliminate impacts to fish species from the construction, operation and maintenance of the proposed project.

2.4.1 Tower Construction Mitigation

To minimize short- and long-term impacts to fish from tower construction:

- To reduce the possibility of sediments or spills entering streams or lakes, towers would be placed over 200 feet (where possible) from the edge of streams or lakes that are known to contain fish.
- Sediment and stormwater controls including silt fence, waterbars, temporary seeding, soil pile covering, and dust control would be implemented on construction sites located near fish bearing water bodies.
- To prevent spills from entering streams and/or groundwater, a spill prevention and spill response plan would be developed and implemented prior to construction. Spill kits would be carried in all construction equipment and vehicles.
- To prevent erosion and sediment movement, vegetation removal would be limited to the amount required for safe working conditions and tower placement. Where possible, vegetation (even if temporarily disturbed but not destroyed) would be left in place.
- To reduce the amount of exposed soils that could be eroded, site restoration would occur as soon as possible following construction. Disturbed areas would be graded to their original contours and planted with native vegetation suitable for the local area. Vegetation would be planted only during appropriate spring or fall growing seasons.

2.4.2 Access Road Mitigation

To minimize short- and long-term impacts to fish from access road construction and use during maintenance activities:

- To protect certain life-stages of fish species, in-water work would only occur during WDFW in-water work windows, or as otherwise authorized or directed by WDFW.
- To prevent damage to stream banks and reduce the potential for sediment or hazardous material input to streams, access roads would be placed as far away from creeks as terrain and ROW will allow.
- Where fish-bearing streams must be crossed, existing access roads would be used where available. New crossings would be constructed using culverts or bridges that allow for uninterrupted fish passage. Fords would be limited to intermittent non-fish-bearing streams and the intermittent headwaters of fish-bearing streams.
- Approaches to stream crossings would be rocked with crushed gravel or other material suitable to prevent erosion and minimize road damage from vehicles and equipment during wet conditions.
- Temporary sediment controls such as silt fence would be installed prior to construction, and monitored for proper function until completion of construction and site restoration. Permanent stormwater and sediment controls like ditches and waterbars would be installed on slopes and maintained periodically.
- Vegetation removal would be limited to only the amount required to safely construct new access roads. Riparian vegetation would be removed only where absolutely necessary.
- Site restoration of cutbanks, fill banks, and other areas of disturbed soils other than the traveled way would be restored as soon as possible after completion of construction. Native vegetation suitable for the area would be planted during the next appropriate growing season following construction.
- Access control structures such as gates, large waterbars and eco blocks would be placed at access road entrances, to limit the amount of vehicular traffic that might create erosion problems or other disturbance to streams containing fish. Signs would be placed on new and existing roads to prevent human encroachment.

3.0 WILDLIFE

3.1 Wildlife Affected Environment

This section discusses the wildlife habitats and species that may be affected by the proposed project.

3.1.1 Study Area

The study area for the wildlife component of this project includes an area approximately two miles on either side of each of the seven proposed line segments that make up the four possible routes. The study area encompasses the northern edge of the Kittitas Valley, the eastern edge of the Yakima Training Center, portions of the middle Columbia River, Lower Crab Creek, the central Saddle Mountains, the Wahluke Slope and the northern edge of the Hanford Reach National Monument.

3.1.2 Methodology

The wildlife section was developed using field visits, literature sources, state and federal database queries, and contact with agency biologists.

3.1.2.1 Field Visits

A field visit to characterize major habitat areas took place in February 2001. The proposed line segments were located in the field and the different habitat types each segment passed through were identified. Few species were observed due to the time of year, however those observations that were made are included in this section. More detailed wildlife surveys will take place during the appropriate time of year once a final route has been selected.

3.1.2.2 Literature Sources

Journal articles, reference books, public agency management plans, agency internet sites and unpublished documents were used to determine species presence, life histories, habitat characteristics, and other information used in this section. Aerial photographs of each route, overlaid with National Wetland Inventory data and plant and wildlife species occurrence data were developed by the BPA and used to supplement the field visits to determine habitat types.

3.1.2.3 Database Queries

The US Fish and Wildlife Service (USFWS) was contacted and asked to provide a list of Threatened and Endangered Wildlife Species that might be present near the proposed project. USFWS provided a list of species that were known to occur in Benton, Grant, Kittitas and Yakima Counties. One Threatened Species (Bald Eagle) and three Candidate Species (Western Sage Grouse, Washington Ground Squirrel and Mardon Skipper) were identified as possibly occurring near the proposed project.

The Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species Program was contacted and asked to provide a map of state Threatened and Endangered species that might be present near the proposed project. WDFW provided quad maps showing rare species and habitat occurrences near the project area. The discussion of species unique to each area within a line segment is drawn mostly from this information.

3.1.2.4 Agency Contacts

Agency biologists from the USFWS, BLM, and WDFW were contacted regarding the presence of threatened or endangered species or other species along the proposed route segments. A meeting was held in Yakima with representatives from the above agencies as well as DNR and BOR that identified a number of areas where such species were known to exist.

3.1.3 Regulations and Management Plans

A number of Federal acts regulate impacts to wildlife from projects such as that proposed here. First, Section 7 of the Endangered Species Act of 1972 (as amended) requires federal agencies to insure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat. In practical terms, this means that projects that have federal involvement must consult with USFWS and/or NMFS to determine if their actions will cause a "take" of a species listed (or proposed for listing) under the act. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

Second, the Migratory Bird Treaty Act of 1918 (as amended) prohibits the killing, capture, or "take," of migratory birds, which includes most bird species, including waterfowl, songbirds and hawks. In some cases (such as hunting), permits may be issued for the killing or collection of certain bird species.

Third, the Bald Eagle Protection Act of 1940 (as amended) prohibits, except under certain specified conditions, the taking, possession and commerce of Bald Eagles.

Management Plans have been developed for a number of areas along the proposed project, most notably for the YTC and Hanford Reach National Monument areas.

The YTC management plan states that the following actions (relevant to the proposed project) will be taken to protect wildlife habitat and resources on the YTC grounds:

- Protect male and female western sage grouse habitat;
- Protect and restore bald eagle wintering habitat;
- Protect ferruginous hawk sites;
- Establish and implement cooperative agreements with state and local agencies, including Western Sage Grouse Conservation Agreement (SGCA);
- Work with WDFW to coordinate and control hunting;
- Protect riparian habitat for wildlife use;
- Avoid and protect habitats used by threatened and endangered species;
- Restrict all activities in a 1-kilometer radius around SGCA-specified leks from March 1 to May 15 between 2400 and 0900;

The Hanford Management Plan indicates that the area over which the power line crosses (with the exception of a small part leading up to the Hanford Substation on the south side of the Columbia River), is designated as a "preservation" land use zone. According to the plan, "preservation" areas are managed

> "…for the preservation of archeological, cultural, ecological, and natural resources. No new consumptive uses (i.e., mining or extraction of non-renewable resources) would be allowed within this area. Limited public access would be consistent with resource preservation. Includes activities related to Preservation uses."

Despite this plan designation, the Hanford National Monument Proclamation and Background Paper of June 9, 2000, specifically mentions that a new BPA transmission line in the approximate alignment proposed in this EIS would not be prohibited.

3.1.4 Regional Context

The study area lies at the western edge of the Interior Columbia Basin. This area is dominated by low shrub-steppe vegetation typical of the region. With the exception of a few riparian and agricultural areas, trees are nonexistent. Elevation ranges from approximately 400 feet asl at the Columbia River, to 3000 feet asl at the Saddle Mountain crest in the YTC and the area north of Ellensburg. In the higher elevations, dwarf shrub-steppe and grassland vegetation exists. Most of the proposed line segments lie within undeveloped areas, although the area between Vantage Substation and Midway and Hanford Substations is heavily agricultural. Transmission line towers are the most dominant human element in much of the study area.

3.2 Wildlife Habitats and Species

The proposed route from Schultz Substation to Hanford Substation (or proposed new Wautoma Substation) was broken into seven proposed line segments. In this section, a general discussion of the habitats and wildlife species common to all line segments is presented, followed by a more detailed discussion of each segment. Each line segment is described based on the discrete geographic areas that exist along the line. The major wildlife habitats that exist within each discrete geographic area are described, and any unique or unusual populations of wildlife (such as the presence of Threatened or Endangered species) are discussed.

3.2.1 Wildlife Habitat Common to All Line Segments

The majority of the study area lies within the dry shrub-steppe ecoregion of eastern Washington. Shrub communities dominated by sagebrush represent the majority of the habitat available in the study area, although the density and species composition of the shrub layer varies considerably. To a lesser extent, grassland habitats are also present. Most of the shrub-steppe vegetation within the study area has been heavily disturbed by cattle grazing, fires, off-road vehicles, clearing, colonization by invasive species and other human-caused disturbance, and thus may provide only marginal habitat for shrub-steppe dependant species. All segments cross areas of riparian vegetation, which are mostly limited to narrow areas on either side of small streams or the Columbia River. Like the shrub-steppe vegetation, these riparian areas have been subjected to heavy disturbance, and have been largely destroyed in some areas. Large trees such as cottonwoods are generally sparse in the riparian areas, with the majority of the

vegetation composed of small trees and shrubs in the early seral stages. Agricultural areas exist within some line segments. Wetland areas are limited to river and stream crossings, as well as the lower Crab Creek and the Saddle Mountain Lake area.

3.2.2 Wildlife Species Common to All Line Segments

Approximately 150 wildlife species (birds, mammals, reptiles and amphibians) are known to use the shrub-steppe habitat type for a some part of their life cycle (Johnson and O'Neil, 2001). The shrub-steppe and shrub-steppe grassland habitat type represents the majority of the available wildlife habitat within the project area. Of these 150 wildlife species, only approximately 50 are closely associated with shrub-steppe habitat, the remaining species use shrub-steppe habitat occasionally for some stage of their life cycle. These 150 species, however, do not represent the total number of species that may be encountered within the proposed project area. For example, a study of the Hanford Site documented 195 bird species in the general area where the project is proposed (Nature Conservancy, 1999). Many of these species were associated with the open water habitats along the Columbia River or were using the area temporarily as they migrated along the Pacific Flyway.

3.2.2.1 Mammal Species

Common large mammal species occupying the shrub steppe communities include mule deer and elk. These species are often present only in the winter in this habitat, with the exception of the Hanford elk herd and a mule deer herd located on the northern section of the Hanford Reach National Monument. Mountain lions may be present in the northern section of the project, closer to mountainous terrain. Rock outcrops, cliffs and talus slope habitats in some areas of the shrub-steppe may be used by bobcats and occasionally by California bighorn sheep.

Smaller mammals inhabiting the shrub-steppe habitat include the coyote, raccoon, badger, striped skunk, black-tailed and white-tailed jackrabbits, mountain cottontail rabbit, least chipmunk, several species of ground squirrels, Great Basin pocket mouse, deer mouse, grasshopper mouse, northern pocket gopher, sagebrush vole, and Merriam's shrew. Yellow-bellied marmots and bushy-tailed wood rats may occur in rocky areas. Approximately fifteen bat species including the western small-footed bat, little brown bat, big brown bat, pallid bat, and several myotis bat species roost in cliffs and talus slopes and feed along riparian drainages

Issues facing shrub-steppe mammal species include conversion of shrub-steppe to agriculture and habitat fragmentation from road building, clearing and other development. Agricultural development in the shrub-steppe region has occurred primarily in areas of deep soils. Species that require deep soils for burrowing such as badgers, ground squirrels, and rabbits have been disproportionately affected and in the case of the Washington ground squirrel and the pygmy rabbit, severely impacted (Johnson and O'Neil, 2001). Fragmentation of habitat may have profound effects on small mammal populations since dispersal patterns are disrupted and areas of suitable habitat are opened up to predators, parasites, and invasion of exotic plant and animals species (Johnson and O'Neil, 2001).

3.2.2.2 Bird Species

Birds commonly associated with the shrub-steppe habitat within the study area include the sage sparrow, western meadowlark, Brewer's sparrows, sage thrasher, horned lark, common raven,

magpie, rock wren, burrowing owl and northern and loggerhead shrike. Sage grouse and sharp-tailed grouse, once common throughout the shrub-steppe habitat, are now limited to small isolated ranges. Raptor species include red-tailed hawk, ferruginous hawk, Swainson's hawk, rough-legged hawk, Northern harrier, golden eagle, bald eagle, and prairie falcon. Rare migrants such as the common loon, and black tern as well as a wide variety of waterfowl and shorebirds may occur along the Columbia River, Crab Creek, or near other open water areas (Johnson and O'Neil, 2001).

Most species of birds that breed in the shrub-steppe habitat are neotropical migrants such as loggerhead shrike, sage and Brewer's sparrows and sage thrasher. Year-round residents include sage and sharp-tailed grouse, ravens, and magpies. Winter residents include birds that breed in northern sites but do not migrate as far south as the neotropical migrants, such as rough-legged hawks and northern shrikes. Bald eagles also winter near the Columbia River and other streams.

Issues facing shrub-steppe bird species are similar to those facing mammals, such as habitat fragmentation and shrub-steppe conversion to agriculture. Some bird species, such as the sage sparrow and the sage thrasher are extremely dependant on intact sagebrush communities with a dense shrub component; therefore disturbances such as clearing and fire may reduce the availability of this habitat. Large, intact patches of sagebrush may also be important to shrub-steppe bird species, especially sage and Brewer's sparrows (Johnson and O'Neil, 2001).

3.2.2.3 Reptile and Amphibian Species

The shrub-steppe area of central Washington supports approximately 20 native reptile species but only about 10 amphibian species. About half of the reptile species are lizards and the other half snakes. Lizard species include western fence lizard, short horned lizard, sagebrush lizard and side-blotched lizard. Gopher snake, western rattlesnake, garter snake, racer and rubber boa are some of the more common snake species, while striped whipsnake and nightsnake are relatively rare. Painted turtles may be present in slow moving water or ponds. Amphibians are generally found only around water, the exception being the Great Basin spadefoot toad, which may be found several kilometers from open water. Western toads and Pacific tree frogs are relatively common near water while tiger salamanders and long-toed salamanders may be found in some wetland areas. Woodhouse's toad is a rare species, but can be found near wetlands in the northern Hanford Reach National Monument (Johnson and O'Neil, 2001).

Reptiles face many of the same threats from habitat fragmentation and conversion to agriculture that shrub-steppe birds and mammals do. Some amphibian species may have benefited from some of the open water and marsh habitats created by irrigation projects. However, the introduction of exotic warmwater species such as bass and bullfrogs has impacted other amphibian species.

3.2.3 Unique Wildlife Habitats and Species Of Each Line Segment

The following sections describe the habitats and species present along each line segment. Each line segment was broken into several distinct areas, generally based on geography. The general types of wildlife habitats and any unusual habitats within each of the areas are described, followed by a discussion of any unique wildlife species or congregations of common species that may be present. The discussion of habitats present along each route was taken from

personal observations, WDFW Priority Habitats and Species data, and several management plans and other studies.

3.2.3.1 Wildlife Habitat and Species of Segment A

The proposed Segment A ROW includes two separate segments. An approximately two mile line segment will be constructed running northeast of the Schultz Substation and paralleling the existing Rocky Reach-Maple Valley 345kV line to connect to the existing Sickler-Schultz line. This will eliminate a crossing approximately five miles east of the Schultz Substation. The remainder of Segment A will parallel the Schultz-Vantage 500kV line on the north side for approximately 24.3 miles southeast to a point near Boylston where proposed segments B_{north}, B_{south} and C begin. The total Segment A length is 29.4 miles.

3.2.3.1.1 Wenatchee Mountains Foothills

The Sickler-Schultz connection line would be located in the foothills of the Wenatchee Mountains north of Ellensburg and the Kittitas Valley. The route would cross Wilson and Naneum Creeks, which are both located in steep canyons. The new Schultz-Hanford line would cross the lowest edge of the slope leading up to the Wenatchee Mountains, crossing Schnebly Creek, Colockum Creek, Cooke Canyon Creek and Caribou Creek on its way. Several outlying agricultural areas, such as irrigated hay fields and pastures are crossed.

3.2.3.1.1.1 Habitat

The upland areas between the Wilson and Naneum Creek canyons is characterized by mostly shrub-steppe vegetation, although some ponderosa pine and Douglas Fir are present in the northern part of the line segment. The riparian areas of these streams, although limited in width and disturbed by grazing are important wildlife habitats, since the larger trees and shrubs provide structural diversity needed by nesting birds, small mammals and other species. A mix of shrub-steppe and grass/forb communities exists along the remainder of the proposed segment.

3.2.3.1.1.2 Unique Wildlife Populations

Wildlife populations in this area are generally typical of shrub-steppe habitats. The area is used as wintering grounds by large herds of mule deer (WDFW, 2001a). The riparian areas of Wilson and Naneum Creeks provide winter roosting and foraging habitat for bald eagles (Personal Observation, 2001). A sagebrush vole was sighted near Schnebly Canyon (WDFW, 2001a). Colockum Creek Canyon is a migration corridor for the Quilomene elk herd. East of Cooke Canyon, a sharp tailed grouse sighting within one mile of the proposed line was recorded in 1981 (WDFW, 2001a). The area east of Cooke Canyon is also known to harbor nesting long-billed curlews (WDFW, 2001a).

3.2.3.1.2 Vantage Highway/I90

South of Caribou Creek, the proposed Segment A route crosses through the rolling terrain around the Vantage Highway and Interstate 90, north of the Boylston Mountains. Segment A ends near Cheviot (an old railroad place name) approximately eight miles south of Interstate 90.

3.2.3.1.2.1 Habitat

The majority of the vegetation in this area is shrub-steppe habitat with typical shrub-steppe species. Sagebrush density varies, with areas in low spots, washes and north slopes tending to be denser, and the upland areas more open with grass and forbs between widely spaced shrubs. The terrain is rolling to flat, with few areas of rocky outcroppings or cliffs.

3.2.3.1.2.2 Unique Wildlife Populations

This area serves as winter habitat for the Quilomene deer and elk herds (WDFW, 2001a). Sage grouse have been repeatedly observed in the area surrounding the proposed line (Clausing, 2001). A sage grouse lek was observed in 1983 less than one mile southwest of the southern end of the line segment (WDFW, 2001a). White-tailed jackrabbits have been observed near the southern end of the proposed segment (WDFW, 2001a).

3.2.3.2 Wildlife Habitat and Species of Segment B_{north}

The proposed ROW would parallel the existing 500 kV line from the northern terminus of the YTC proposed route east 9.5 miles to the Vantage Substation. The proposed ROW crosses three distinct areas. The majority of the proposed line crosses through the shrub-steppe of the YTC. At the eastern end of the segment, the line crosses the steep cliffs and narrow riparian area of the Columbia River. The Vantage Substation lies on a plateau at the top of the east bank of the Columbia River.

3.2.3.2.1 Northern Yakima Training Center

The Yakima Training Center area of Segment B_{north} runs from the end of Segment A to the edge of the Columbia River canyon through mostly rolling terrain with some steeper canyons of Johnson Creek and Middle Canyon.

3.2.3.2.1.1 Habitat

The majority of the vegetation along this segment is shrub-steppe habitat with typical shrub-steppe species. The proposed route passes through the upper Badger Creek complex and the Johnson Creek and Middle Canyon drainages that contain some limited riparian areas. These canyons also provide rocky outcrops, ridge tops and steep slopes representing a small but significant component of the available habitat (US Army, 1996).

3.2.3.2.1.2 Unique Wildlife Populations

The WDFW (Clausing, 2001) has indicated that sage grouse may be present in the area surrounding the proposed ROW. Also, loggerhead shrike, sage thrashers, sage sparrows, and Swainson's hawks are known to occur in the general vicinity of the proposed ROW (Stepniewski, 1998, US Army, 1996).

3.2.3.2.2 Columbia River

Segment B_{north} crosses the Columbia River just below the Wanapum Dam. The Columbia River sits in a canyon approximately 300 feet deep, with steep cliffs on the west side. The east side of the river, below the Vantage Substation features a flat depositional bar elevated from the main channel approximately 40 feet, leading to a moderate slope that climbs approximately 400 feet to a plateau where the Vantage Substation sits.

3.2.3.2.2.1 Habitat

The area on west side of the Columbia is characterized by steep rocky cliffs, some with talus slopes along the bottom edge. A narrow riparian area composed mostly of grasses exists next to the Columbia River. The east side includes a narrow grassy riparian area with scattered trees, a flat depositional bar covered in sagebrush and grasses, followed by a moderately steep area of alternating cliffs and steep slopes with scattered shrubs and grasses. The riparian areas are subject to frequent changes in water level due to the operations of Wanupum dam several hundred meters upstream. The area surrounding the river receives a high amount of

recreational use, especially during the summer months, and existing habitats are subjected to frequent human disturbance.

3.2.3.2.2.2 Unique Wildlife Populations
Numerous species more often associated with wetlands and riparian habitats are found in this area. Ring- billed and California gulls, Caspian and Forster's terns, and Canadian geese are present. This section of the Columbia River is located within the Pacific flyway and, during the spring and fall months, the area serves as a resting point for neotropical migrants, migratory waterfowl, and shorebirds. During the fall and winter months, large numbers of migratory ducks (>100,000) and geese (>10,000) find refuge in the Wanapum reservoir (WDFW, 2001a). Other species present during winter months include American white pelicans, double-crested cormorants, and common loons. Bald eagles winter along the Columbia River (Personal Observation, 2001). An historical sighting of a desert nightsnake within one mile of the proposed project was made on the west shore of the Columbia River (WDFW, 2001a).

3.2.3.2.3 Vantage Substation Area
The Vantage Substation sits on a plateau above the east rim of the Columbia River canyon. Transmission lines enter the substation from the north and south. A small depression north of the substation contains a wetland complex.

3.2.3.2.3.1 Habitat
The area surrounding the Vantage Substation contains a unique complex of basalt cliffs, sand dunes, shrub-steppe and small wetlands. High quality riparian vegetation exists within the wetland areas.

3.2.3.2.3.2 Unique Wildlife Populations
Species of special note recorded as using the area surrounding the Vantage Substation include the striped whipsnake and the desert nightsnake (WDFW, 2001a). Bird species often found along the Columbia River (see Columbia River Section 3.2.3.2.2.) also utilize the wetland areas.

3.2.3.3 Wildlife Habitat and Species of Segment B_{south}

Segment B_{south} generally parallels Segment B_{north}, therefore the wildlife habitat and species are similar to those discussed under Segment B_{north} (Section 3.2.3.2.). The total distance of Segment B_{south} is 10.4 miles.

3.2.3.4 Wildlife Habitat and Species of Segment C

The proposed ROW cuts south from the existing 500 kV Vantage-Raver line at an area approximately eight miles south of Interstate 90 and travels 29.8 miles to the proposed Wautoma substation near Blackrock. Seven distinct areas characterize this route: the northern YTC area, the Saddle Mountains, the central YTC area (including four drainage complexes), Umtanum Ridge, Cold Creek, Yakima Ridge, and the Dry Creek Valley

3.2.3.4.1 Northern Yakima Training Center
The Yakima Training Center area of Segment C runs from the end of Segment A to the bottom of the Saddle Mountains. The proposed ROW crosses Johnson Creek through mostly rolling terrain. Wildlife habitat and species in this area is similar to that discussed in the Segment B_{north} discussion (Section 3.2.3.2.) of the Northern Yakima Training Center area.

3.2.3.4.2 Saddle Mountains (West of Columbia River)
The Saddle Mountains are one of three anticlines in the YTC running east west (Saddle Mountains, Umtanum Ridge and Yakima Ridge). The proposed Segment C ROW crosses the Saddle Mountains at approximately the 3100-foot elevation. The Saddle Mountains rise abruptly 1500 feet above the surrounding landscape. The mountains are high enough to catch and retain snowfall, which may accumulate to three feet or more during some winters.

3.2.3.4.2.1 Habitat
The slopes of the Saddle Mountains are mostly vegetated, but very steep with rocky outcrops and talus slopes interspersed throughout. The rocky areas provide habitat for raptor species, marmots, bobcats and lizards.

3.2.3.4.2.2 Unique Wildlife Populations
Loggerhead shrike, golden eagle, ferruginous hawk, Swainson's hawk, prairie falcon, and sage thrasher are all known to use the northern slope of the Saddle Mountains (Stepniewski, 1998).

3.2.3.4.3 Central Yakima Training Center
From the bottom of the south side of the Saddle Mountains, the proposed ROW cuts across three drainage complexes (Hanson Creek, Alkali Canyon, and Corral Canyon) to the bottom of Umtanum Ridge. The terrain is hilly, with steep canyons and ridges trending east west.

3.2.3.4.3.1 Habitat
Wildlife habitat in the Central Yakima Training Center area includes riparian areas, steep rocky cliff areas, and upland areas of shrub-steppe vegetation. The riparian vegetation of Hanson Creek, Alkali Canyon and Corral Canyon are important wildlife habitats, since large trees, shrub species (other than sagebrush), and grasses and forbs are present that provide nesting and perching habitat. The open water areas of the creeks provide an important water source for birds and mammals, especially larger mammals such as deer and coyote.

3.2.3.4.3.2 Unique Wildlife Populations
The area between the Saddle Mountains and Umtanum Ridge is home to approximately 70 percent of the YTC mule deer population (300-400 deer) (US Army, 1996). The upland areas near Hanson Creek supports over 75% of the breeding populations of loggerhead shrike on the YTC, and supports Swainson's hawks (US Army, 1996). The Hanson Creek riparian area on either side of the proposed ROW has documented bald eagle winter roost sites (WDFW, 2001a, US Army, 1996). Lewis's woodpeckers are also known to exist in the Hanson Creek Riparian area (US Army, 1996). Alkali Canyon complex supports an historic sage grouse lek and known populations of nesting prairie falcons (US Army, 1996). Cliffs in Corral Canyon downstream of the proposed ROW also have documented prairie falcon nests (US Army, 1996, WDFW, 2001a). Breeding burrowing owls were sighted approximately 1.5 miles southwest of the proposed ROW between Corral Canyon and Sourdough Canyon in 1993 and 1994, but the nest was unoccupied in 1995-1997 (WDFW, 2001a). Sage sparrows have been observed in the Corral Canyon area as well (US Army, 1996). Long billed curlews have been observed in the Corral Canyon complex near the proposed ROW (Stepniewski, 1998).

3.2.3.4.4 Umtanum Ridge
The second anticline in the YTC, Umtanum Ridge, runs east west like the Saddle Mountains. The proposed ROW crosses Umtanum Ridge approximately three miles west of the Priest Rapids Dam. The ROW climbs approximately 1300 feet up the steep rocky north face where it

crests the ridge at approximately the 3000-foot elevation. The south side is a gentler slope that drops approximately 900 feet to Cold Creek. This side of the ridge is intersected with small drainages running south to Cold Creek. Umtanum Ridge, like the Saddle Mountains, collects significant snowfall in most winters.

3.2.3.4.4.1 Habitat

Umtanum Ridge, like the Saddle Mountains, has a steep northern slope covered mostly with shrub-steppe vegetation. Some rocky outcroppings on the north side provide habitat for raptors. The gentler south side has flat areas along the ridgelines between the small canyons draining south to Cold Creek that have relatively undisturbed shrub-steppe vegetation. These areas provide good habitat for sage grouse.

3.2.3.4.4.2 Unique Wildlife Populations

Breeding sage grouse have been observed on the flatter areas of the south side of Umtanum Ridge. Several leks are located less than one mile west of the proposed ROW. WDFW (Clausing, 2001) and Schroeder et. al. (2000), indicate that this area is considered the core area of one of the two remaining sage grouse populations in Washington. Merriam's shrews were caught in research traps at the top of Umtanum Ridge, near the proposed ROW (Wunder et. al., 1994).

3.2.3.4.5 Cold Creek

Between Umtanum Ridge and Yakima Ridge lies the Cold Creek canyon. The canyon is approximately 900 feet deep and parallels the ridges running east-west. Both sides of the canyon are relatively gentle slopes, although the south side (north side of Yakima Ridge) has some steeper outcroppings, particularly near Cairn Hope Peak, just west of the proposed ROW.

3.2.3.4.5.1 Habitat

The riparian area of Cold Creek provides more structurally diverse habitat than the surrounding shrub-steppe in the form of shrubs, trees, wetland areas and open water. The Cold Creek canyon contains an important mixture of native shrub-steppe vegetation and riparian areas between the Hanford Reach National Monument area and the YTC that acts as a corridor for wildlife moving to and from these locations. In addition, the Cold Creek canyon is one of the most important flyways in Washington for migrating birds (Stepniewski, 1998, Visser, 2001).

3.2.3.4.5.2 Unique Wildlife Populations

Elk, deer, sage grouse, loggerhead shrike and jackrabbits all use the Cold Creek canyon as a local migration corridor between the Hanford Reach National Monument and the YTC. Neotropical migrants, waterfowl, raptors and many other bird species use the canyon as a migration corridor as part of their longer journeys between regions north and south of Central Washington (Stepniewski, 1998). Many of these migrants may stop and temporarily use the riparian or upland habitats. Breeding Swainson's hawks and loggerhead shrikes have been documented within one mile of the proposed ROW (WDFW, 2001a, US Army, 1996).

3.2.3.4.6 Yakima Ridge

The third anticline in the YTC, Yakima Ridge, runs east west like the Saddle Mountains and Umtanum Ridge. The proposed ROW crosses Yakima Ridge diagonally to the southeast. The ROW climbs approximately 800 feet up the north face where it crests the ridge at approximately the 2800-foot elevation. The ROW crosses several drainages running to the east, then drops down the south side approximately 1800 feet to Dry Creek. Like Umtanum Ridge, Yakima Ridge has drainages down either side that form steep canyons running perpendicular to the ridge.

Snowfall in the area of the proposed ROW can be significant, but is somewhat less than the Saddle Mountains or Umtanum Ridge since the area is further south and east, and is on the downslope side of Yakima Ridge.

3.2.3.4.6.1 Habitat

Yakima Ridge, like the Saddle Mountains and Umtanum Ridge, has slopes covered mostly with shrub-steppe vegetation. Some rocky outcroppings on both sides of the ridge in small canyons provide habitat for raptors and species such as marmots and wood rats that prefer rocky habitats and scree slopes. The gentler south side has flat areas along the ridgelines between the small canyons draining south to Cold Creek that have deeper soils and relatively undisturbed shrub-steppe vegetation.

3.2.3.4.6.2 Unique Wildlife Populations

The entire eastern end of Yakima Ridge is considered a part of the Cold Creek migration corridor (see discussion above). On the south side of the ridge breeding prairie falcons were observed in 1988 within one mile of the proposed ROW (WDFW, 2001a). Multiple sightings of breeding burrowing owls have been made in an area adjacent to Highway 24 where the proposed ROW crosses (WDFW, 2001a).

3.2.3.4.7 New Wautoma Substation

The proposed new substation sits at the southern base of Yakima Ridge, in the shallow, broad valley of Dry Creek.

3.2.3.4.7.1 Habitat

The vegetation surrounding the new substation is heavily disturbed shrub-steppe vegetation. The area is open and relatively flat. Dry Creek, true to its name, is intermittent. Due to the presence of some water during parts of the year, the creek bottom has a higher density of shrubs than the surrounding areas but does not contain a true riparian community. Some surrounding areas have some of the highest quality shrub-steppe vegetation in the state of Washington, including the top of the Yakima Ridge .75 miles north of the site and a large area of shrub-steppe vegetation 2.5 miles east of the site in the Fitzner-Eberhardt Arid Lands Ecology (ALE) Reserve portion of the Hanford Reach National Monument. However, the area within and immediately surrounding the site is highly degraded from fires, livestock grazing and past agricultural practices.

3.2.3.4.7.2 Unique Wildlife Populations

A small colony of burrowing owls was observed 0.5 miles east of the new substation site (Personal Observation, 2001). Prime elk wintering habitat for the Hanford elk herd is located several miles east of the site along Dry Creek in the ALE Reserve. The Hanford elk herd, unique among elk herds because it exists exclusively in shrub-steppe habitat, travels at least as far upstream as the proposed substation, as evidenced by elk dropping on the site (Personal Observation, 2001). These elk probably travel much further, since the numbers of elk has dramatically increased over the past several years and numerous reports of straying animals are documented (WDFW, 2000).

3.2.3.5 Wildlife Habitat and Species of Segment D

The proposed ROW for Segment D would parallel and double circuit the existing Vantage-Midway 230-kV line then parallel the existing Big Eddy-Midway line southwest to the proposed new substation, a total of 27.3 miles. This proposed route segment crosses ten distinct areas

which are, from north to south: the Vantage Substation area, the Beverly area, Lower Crab Creek, the Saddle Mountains, the Wahluke Slope, the Columbia River, Umtanum Ridge, the Cold Creek drainage, Yakima Ridge, and Dry Creek.

3.2.3.5.1 Vantage Substation Area

The proposed line exits the Vantage Substation to the south. This area is discussed in the section describing Segment B_{north} (Section 3.2.3.2.).

3.2.3.5.2 Beverly Area

The proposed ROW of Segment D cuts south diagonally across the gentle east edge of the Columbia River canyon then east of the town of Beverly on the flats where Crab Creek Coulee enters the Columbia River. The area is primarily shrub-steppe vegetation, although several agricultural areas lie on either side of the proposed line.

3.2.3.5.2.1 Habitat

The habitat along this section of Segment D is mostly shrub-steppe vegetation. Several roads and a railroad intersect the proposed ROW, and agricultural operations are located within 0.5 miles of each side of the ROW. A high degree of disturbance exists in this area, which limits the quality of the available habitat. The proposed ROW is next to the Columbia River, which is an important winter habitat for waterfowl and a bird migration corridor (described in more detail in Segment B discussion).

3.2.3.5.2.2 Unique Wildlife Populations

Nightsnakes and striped whipsnakes have been documented adjacent to and under the proposed ROW (WDFW, 2001a). Bird species associated with the Columbia River may be incidental visitors to this area (see Segment B_{north} Section 3.2.3.2.discussion).

3.2.3.5.3 Crab Creek

The proposed ROW crosses Crab Creek just east of its confluence with the Columbia River and approximately four miles south of the Vantage Substation.

3.2.3.5.3.1 Habitat

Crab Creek and its associated wetlands and riparian areas offer high quality habitat for many species of wildlife. Open water areas such as Nunnally Lake, Crab Creek and other smaller wetlands are present, and provide excellent waterfowl habitat. Willows, shrubs and large areas of sedges, reeds and grass provide greater structural diversity than the surrounding shrub-steppe vegetation.

3.2.3.5.3.2 Unique Wildlife Populations

The lower Crab Creek area is one of the most important waterfowl breeding grounds in Washington, and an important wintering ground (Clausing, 2001, WDFW, 2001a). Many bird species also use the open water and wetlands for resting and feeding on their annual migrations along the Pacific Flyway. Beaver are found in some open water areas. A small isolated population of Ord's kanagaroo rat may occupy sandy habitats on either side of Crab Creek.

3.2.3.5.4 Saddle Mountains

Immediately after crossing Crab Creek, the proposed ROW climbs approximately 1500 feet up the steep northern side of the Saddle Mountains and crests at approximately the 2100-foot elevation. The line continues to the southeast over the crest of the Saddle Mountains and down the gentler southern side towards the Wahluke Slope.

3.2.3.5.4.1 Habitat

The Saddle Mountain area provides a variety of wildlife habitats, including cliffs, talus slopes, benches, open grassy slopes and shrub-steppe habitats. The steep north side has many steep rocky outcroppings, mostly located on the top third of the slope. Habitat for bats, and raptors is abundant here. The crest of the Saddle Mountains has a unique dwarf shrub-steppe vegetation community with a number of rare plant species (Fisher, 2001). The south side contains some high quality shrub-steppe vegetation that is relatively undisturbed. A designated sage grouse movement corridor exists along the south slope of the Saddle Mountains, although no sage grouse have been observed recently in the area (Schurger, 2001, Visser, 2001)

3.2.3.5.4.2 Unique Wildlife Species

Large populations of Brewer's vesper, and sage sparrows, sage thrasher and other passerine bird species can be found in the spring and summer on the south side of the Saddle Mountains. The cliffs on the north and west side of the Saddle Mountains are home to many raptor species, including red-tailed, Swainson's, ferruginous and rough-legged hawks; prairie falcons; American kestrels; bald and golden eagles, and ravens (WDFW, 2001a). A golden eagle nest site is located less than one mile west of the proposed line in the Sentinel Bluffs, which lie above and just east of the Columbia River. A prairie falcon nest site is located on the north slope of the Saddle Mountains just below the crest within 0.25 miles of the proposed line (WDFW, 2001a). A striped whipsnake was sighted at the crest of the Saddle Mountains near the proposed line in 1979 (WDFW, 2001a).

3.2.3.5.5 Wahluke Slope

The proposed ROW crosses the Wahluke Slope just east of the town of Mattawa. The Wahluke Slope, as its name implies, is a broad, gentle slope that stretches from the base of the Saddle Mountains south to the Columbia River. The landscape is generally flat, with few terrain features.

3.2.3.5.5.1 Habitat

This area of the Wahluke Slope is heavily farmed, with very little remaining native shrub-steppe habitat. Circle-irrigated crops, cherry, peach and apple orchards, and vineyards provide the majority of the available wildlife habitat. Irrigation provides some small wetland areas associated with canals, irrigation return flows or wells, but these areas are very limited in size.

3.2.3.5.5.2 Unique Wildlife Species

Mammal species present are limited to those species that can tolerate high levels of disturbance, such as coyotes, raccoons, and a variety of rodent species. Structures such as barns and sheds provide roosting habitat for a number of bat species. Bird species present on the Wahluke Slope are also limited to those species that can tolerate high levels of human disturbance. Red-tailed hawks, American kestrels, crows and ravens are present, as well as a number of songbirds. Pheasant and quail utilize croplands. Red-winged and yellow-headed blackbirds may use the limited wetland areas associated with irrigation practices. Near the southern end of the area a breeding loggerhead shrike was observed within a mile of the proposed ROW in 1993 (WDFW, 2001a).

3.2.3.5.6 Columbia River

The proposed ROW crosses the Columbia River just west of the Vernita Bridge on Highway 24. Three existing transmission lines cross the Columbia River at this location, and Highway 243 parallels the north side of the river. The Columbia River in this area is in a wide, shallow canyon.

The north edge of the canyon is an old gravel bar with an area of sand dunes. The south side is also an old gravel bar (China Bar). The Midway Substation is located on the China Bar below the steep cliffs of Umtanum Ridge. This area is the upstream end of the Hanford Reach, the last free-flowing, non-tidal section of the Columbia River in the United States.

3.2.3.5.6.1 Habitat

A unique area of sand dunes and Indian rice grass exists north of the Columbia River crossing (WDFW, 2001a). This area receives moderate recreational use and the sand dunes and the surrounding native shrub-steppe vegetation has been disturbed by ORV use. The China Bar area on the south side is mostly shrub-steppe vegetation that has also been disturbed by recreational use. The riparian areas on either side of the open water of the Columbia River are narrow and composed mostly of grasses and forbs, with some trees. These riparian areas are subject to regular inundation as water levels fluctuate due to operations at Priest Rapids Dam several miles upstream. The section of the Columbia River where the proposed ROW crosses is at the upstream end of the Hanford Reach, an important spawning area for chinook salmon. These salmon provide a high quality food source that attracts various species of wildlife including bald eagles.

3.2.3.5.6.2 Unique Wildlife Species

Like the Columbia River crossings described in Segment B, this section of the Columbia River supports large numbers of wintering waterfowl. This section of the Columbia River (like the Segment B crossings), is located within the Pacific flyway and, during the spring and fall months, the area serves as a resting point for neotropical migrants, migratory waterfowl, and shorebirds. Bald eagles are present throughout the Hanford Reach during the winter, feeding on waterfowl and salmon carcasses WDFW, 2001a). Several Swainson's hawk nests have been documented on the China Bar south of the Columbia River approximately one mile east of the proposed ROW (WDFW, 2001a).

3.2.3.5.7 Umtanum Ridge

Directly south of the Midway Substation, the proposed ROW climbs approximately 950 feet up the steep north facing slope of Umtanum Ridge to approximately the 1380 foot elevation, then travels down the much gentler south slope of the ridge into the Cold Creek drainage.

3.2.3.5.7.1 Habitat

The steep northern side of Umtanum Ridge is a mixture of rocky outcroppings, talus slopes and cliffs interspersed with areas of shrub-steppe vegetation. The top of Umtanum Ridge and the south side is gently rolling shrub-steppe habitat.

3.2.3.5.7.2 Unique Wildlife Species

The cliffs of the north side of Umtanum Ridge harbor a large number of raptor species. The proposed ROW passes close to a known prairie falcon nest (WDFW, 2001a). Other known prairie falcon nests are located within one or two miles on both sides of the proposed ROW (WDFW, 2001a). A loggerhead shrike was sighted at the crest of Umtanum Ridge in 1994 (WDFW, 2001a). On the south slope of Umtanum Ridge, a Swainson's hawk nest was observed in 1990 within the proposed ROW (WDFW, 2001a). Three other Swainson's hawk nests are located within one mile of the proposed ROW (WDFW, 2001a).

3.2.3.5.8 Cold Creek

The proposed ROW crosses Cold Creek between Umtanum Ridge and Yakima Ridge. Cold Creek is in a broad, almost flat valley here, unlike the steeper canyon upstream where proposed Segment C crosses. Highway 24 roughly parallels Cold Creek.

3.2.3.5.8.1 Habitat

The broad valley of Cold Creek in this area contains a mixture of grassy shrub-steppe and agriculture. Cold Creek itself contains little riparian habitat in this area, but does have areas of relatively undisturbed shrub-steppe vegetation. As discussed in Segment C, Cold Creek acts as an important migration corridor of relatively undisturbed shrub-steppe habitat between the YTC and the Hanford Site exists along Cold Creek. The Cold Creek Valley is also a major bird migration corridor.

3.2.3.5.8.2 Unique Wildlife Species

The Cold Creek migration corridor is used by elk, mule deer, sage grouse, jackrabbits, songbirds and other animals traveling between the YTC and the Hanford Site (WDFW, 2001a, Clausing, 2001, Stepniewski, 1998). Neotropical migrants, waterfowl, raptors and many other bird species use the canyon as a migration corridor as part of their longer journeys between regions north and south of Central Washington (Stepniewski, 1998). Many of these migrants may stop and temporarily use the upland habitats. Nesting burrowing owls have been observed next to the proposed ROW near Highway 24 (WDFW, 2001a). Prairie falcons, golden eagles, Swainson's hawks and Lewis' woodpeckers have all been observed using the Cold Creek valley for nesting or foraging near where the ROW crosses (Stepniewski, 1998).

3.2.3.5.9 Yakima Ridge

From Cold Creek, the proposed ROW climbs gently up the north slope of Yakima Ridge approximately 550 feet to the 1550 foot elevation, then drops steeply approximately 500 feet into the proposed new Substation. The hills are smooth, with few rocky outcroppings.

3.2.3.5.9.1 Habitat

Both sides of Yakima Ridge under the proposed ROW are relatively undisturbed shrub-steppe, although some agricultural activity has taken place on the north side west of the proposed ROW. The top of Yakima Ridge is a nearly pristine bluebunch wheatgrass community that is partially covered with sage.

3.2.3.5.9.2 Unique Wildlife Species

WDFW PHS database documented no occurrences of unique wildlife populations in the area immediately surrounding the proposed ROW crossing of Yakima Ridge. However, Stepniewski (1998), indicates that grasshopper sparrows, sage sparrows, sage thrashers, golden eagles and ferruginous hawks have been observed close to the proposed ROW.

3.2.3.5.10 New Wautoma Substation

The proposed ROW enters the proposed new substation from the north. This area is previously discussed under Segment C (Section 3.2.3.4.).

3.2.3.6 Wildlife Habitat and Species of Segment E

Segment E parallels Segment D to the east from Vantage to the top of the Saddle Mountains, then turns southeast, crosses the Wahluke Slope, enters the Hanford Reach National Monument and ends at the Hanford Substation. This segment is 23.2 miles long and crosses six

distinct areas: the Vantage area, Crab Creek, the Saddle Mountains, the Wahluke Slope, the Hanford Reach National Monument, and the Columbia River.

3.2.3.6.1 Vantage Area
The proposed Segment E ROW parallels proposed Segment D approximately 0.5 miles to the east. The habitats and species present in the Vantage area have been previously discussed in Segment D.

3.2.3.6.2 Crab Creek
The proposed Segment E ROW crosses Crab Creek approximately 0.5 miles east of where proposed Segment D crosses. The habitats and species present in Crab Creek have been previously discussed in Segment D.

3.2.3.6.3 Saddle Mountains
The proposed ROW continues to parallel Segment D as it climbs the steep northern side of the Saddle Mountains immediately after crossing Crab Creek. From the crest of the Saddle Mountains, however, the proposed ROW turns southeast at the crest of the Saddle Mountains and heads across a part of the Wahluke Slope towards Hanford further to the east than Segment D. Habitat and species in the Saddle Mountains for this segment are similar to those existing along Segment D.

3.2.3.6.4 Wahluke Slope
The proposed ROW crosses the central part of the Wahluke Slope. The Wahluke Slope in this area is very gently sloping to the south. Like proposed Segment D, the proposed ROW crosses through an area of the Wahluke Slope that is heavily farmed, with very little remaining native shrub-steppe habitat. Habitats and species are similar to those discussed under Segment D. No unique species are documented in the Wahluke Slope area along proposed Segment E

3.2.3.6.5 Hanford Reach National Monument
Southeast of Highway 24, the proposed ROW crosses into the Hanford Reach National Monument. The area is generally flat, although the line drops into a shallow depression that contains Saddle Mountain Lake. The terrain is slightly rolling and hummocky. Sand dunes and blowouts are scattered throughout the area.

3.2.3.6.5.1 Habitat
The proposed ROW passes through a variety of habitats in the Hanford Reach National Monument. The northwestern end of the line where it crosses Highway 24 generally has a sagebrush-dominated community interspersed with grassy sand dune areas. As the line drops into the shallow basin that contains Saddle Mountain Lake, the vegetation turns to more of a grass dominated habitat, with only sparse shrub areas. A well-developed riparian area surrounds Saddle Mountain Lake and the channel leading east from it. Closer to the Columbia River, the terrain is flat or gently sloped south and covered by a patchwork of shrubby and grassy areas. The USFWS indicates that this area is considered very high quality shrub-steppe habitat (Haas, 2001)

3.2.3.6.5.2 Unique Wildlife Species
Where the proposed line crosses Highway 24 and enters the Hanford Reach National Monument, burrowing owls have been observed, although no nest sites are documented in this area (WDFW, 2001a). Near Saddle Mountain Lake, many observations of Woodhouse's Toads have been made (WDFW, 2001a). A herd of approximately 70 mule deer exists in the area east

and south of Saddle Mountain Lake (WDFW, 2001a, Haas, 2001, Personal Observation, 2001). Closer to the Columbia River, near the Saddle Mountain Wasteway, nesting Swainson's hawks and great blue herons have been observed (WDFW, 2001a). Sagebrush lizards and nightsnakes have been documented near the proposed ROW (Nature Conservancy, 2001). Sagebrush voles and pygmy rabbits are also documented in the area surrounding the proposed segment (Brunkal, 2001)

3.2.3.6.6 Columbia River

The proposed ROW crosses the Columbia River in the middle of the Hanford Reach and stops just south of the river at the existing Hanford Substation. The north bank of the Columbia River in this area is not well defined, but slopes gently up from the river. The south bank is steep, but no more than approximately 50 feet high.

3.2.3.6.6.1 Habitat

The riparian area of the Columbia is very narrow and composed mostly of grasses, with a few widely spaced trees. There is little variation in the landscape on the north side, although the steep south bank may provide some suitable denning areas for burrowing mammals. The entire Hanford Reach provides important open water habitat for waterfowl.

3.2.3.6.6.2 Unique Species Present

As with the rest of the Columbia River in central Washington, hundreds of thousands of waterfowl use the open water habitats and wetlands as breeding areas, overwintering areas, or stopovers on spring and fall migrations. These species, as well as neotropical migrants may be present in or near the river. Communal bald eagle roosts are located within three miles of each side of the proposed ROW crossing (WDFW, 2001a).

3.2.3.7 Wildlife Habitat and Species of Segment F

Proposed Segment F heads east for several miles from the Vantage Substation, then turns south, crosses Crab Creek and heads up the steep northern slope to the top of the Saddle Mountains, just east of the where Segments D and E cross the Saddle Mountain crest. From here, the line heads east just south of the crest of the Saddle Mountains for approximately 15 miles. Where the segment intersects the Grand Coulee-Hanford 500kV line, it turns south and parallels it into the Hanford Substation. The segment length is 32.1 miles. The proposed line crosses 6 distinct areas: the Vantage area, Crab Creek, the Saddle Mountains, the Wahluke Slope, the Hanford Reach National Monument and the Columbia River.

3.2.3.7.1 Vantage Area

The proposed ROW heads east out of the Vantage Substation for approximately two miles, then turns south down a gentle slope to Crab Creek, approximately four miles. The area immediately surrounding the substation has been discussed in Segment B and D. However, the area to the east of the substation is flatter and has more agricultural activity associated with it than the other segments.

3.2.3.7.1.1 Habitat

Proposed Segment F crosses through areas composed mostly of shrub communities, although circle irrigation, orchards and vineyards are immediately adjacent to each side of the proposed line.

3.2.3.7.1.2 Unique Species Present

An observation of an Ord's kangaroo rat caught in a trap was made in 1987 (WDFW, 2001a), within the proposed ROW (see the Crab Creek discussion below for more information on Ord's kangaroo rat). A ferruginous hawk nest was observed in 1995 approximately one mile east of the proposed line (WDFW, 2001a).

3.2.3.7.2 Crab Creek

The proposed ROW crosses Crab Creek approximately one mile east of where proposed Segments D and E would cross. More extensive wetlands are present in this area than exist near Segments D and E.

3.2.3.7.2.1 Habitat

As discussed in the Segment D section, Crab Creek and its associated wetlands and riparian areas is one of the most important waterfowl breeding grounds in Washington. Nunnally Lake is important habitat for waterfowl. An area of sand dunes and willows exists just north of Crab Creek.

3.2.3.7.2.2 Unique Wildlife Species

Nunnally Lake supports a large population (3-4000) of wintering ducks (WDFW, 2001a). Quail have been observed using varied habitats along the valley bottom. In addition, within 0.5 miles of the proposed line, a number of Ord's kangaroo rats were caught in 1996 and 1997 (Gitzen, et. al., 2001). This sighting, and the observation made in 1987 two miles north of Crab Creek are significant in that they represent new sightings in areas where this species previously was not recorded.

3.2.3.7.3 Saddle Mountains

The proposed ROW climbs the steep northern side of the Saddle Mountains immediately after crossing Crab Creek. The line parallels proposed Segment E for approximately 0.75 miles, then turns due east for approximately 14 miles along the lower half of the slope to the existing Grand Coulee-Hanford 500kV line.

3.2.3.7.3.1 Habitat

The habitats and species of the western end of the Saddle Mountains has been described in Segments D and E. Segment F is not located far enough from these segments to warrant a separate discussion. However, where Segment F turns east and follows the lower slope of the Saddle Mountains, different habitat conditions are encountered. On the south slope, the vegetation community changes from a sagebrush-dominated community on the west end to a grass-dominated community on the east end. A number of canyons intersect the south slope, providing some rocky outcrop and talus slope habitats.

3.2.3.7.3.2 Unique Wildlife Species

No observations of unique wildlife species have been made in this area, however this may be due to the extremely limited access in the area. WDFW and BLM report that sage grouse were historically present along the Saddle Mountains, and that the relatively intact shrub-steppe vegetation is still considered a migration corridor between the YTC and areas east of the Saddle Mountains (Clausing, 2001, Fisher, 2001). In addition, species such as prairie falcons, ferruginous hawks and loggerhead shrikes have been observed on the crest and the north slope of the Saddle Mountains, within several miles of the proposed line (WDFW, 2001a). The area surrounding the proposed ROW supports one of the largest contiguous areas of occupied habitat for sage sparrows known in Washington (Nature Conservancy, 1999).

3.2.3.7.4 Wahluke Slope

The proposed ROW parallels the Grand Coulee-Hanford 500kV line that crosses the eastern part of the Wahluke Slope. This area of the Wahluke Slope is part of the Hanford Reach National Monument area and is located just east of the heavily farmed area. With the exception of the Wahluke Branch Canal, which runs west to east, the area north of Highway 24 is relatively undisturbed and retains much of its pre-development condition. The area slopes gently to the south.

3.2.3.7.4.1 Habitat

Areas of dense sagebrush dominate the habitat. There are no outstanding terrain features.

3.2.3.7.4.2 Unique Wildlife Species

The dense sagebrush provides nesting habitat for a number of Swainson's hawks. Three nests have been observed within one mile east of the proposed ROW (WDFW, 2001a).

3.2.3.7.5 Hanford Reach National Monument

South of Highway 24, the proposed ROW drops over a steep slope approximately 200 feet into a large depression that to the west contains Saddle Mountain Lake. At the south end of the depression, the line intersects with proposed Segment E, and heads south to cross the Columbia River in the same alignment.

3.2.3.7.5.1 Habitat

The depression south of Highway 24 contains a mixture of sand dunes, blowouts and intermittent wetlands. A mixture of sagebrush and grasslands is present. The steep slope on the northern edge of the depression is composed of soft substrate materials.

3.2.3.7.5.2 Unique Wildlife Species

A Swainson's hawk nest was observed on the top of the slope directly in the path of the proposed ROW (WDFW, 2001a). A herd of approximately 40 mule deer was observed in the central part of the depression (personal observation, 2001). Near the southern end of the proposed segment, immature sage sparrows were observed within one mile of the proposed line in 1987 (WDFW, 2001a). Sagebrush lizards and nightsnakes have been documented near the proposed ROW (Nature Conservancy, 2001).

3.2.3.7.6 Columbia River

The proposed Segment F ROW crossing of the Columbia River follows the same alignment that Segment E does. Wildlife habitats and species will be the same as discussed in Segment E.

3.2.4 Threatened and Endangered Species

This section discusses federally listed Threatened, Endangered and Proposed species and other species that are likely to be listed in the near future that may occur in the project area. These species include the bald eagle, the sage grouse, the Washington ground squirrel, and the Mardon skipper.

3.2.4.1 Bald Eagle

The bald eagle is a federally listed threatened species, but is proposed for de-listing. The Washington Department of Fish and Wildlife is reviewing their status as a state threatened species. There are approximately 650 nesting pairs of bald eagles in Washington and as many as 3,000-4,000 wintering bald eagles.

Bald eagles in Washington are generally migratory. Eagles that nest in Washington usually move north after nesting to feed on early salmon runs in western British Columbia and southeast Alaska. Many of the eagles that winter along rivers in Washington are birds that nest in Alaska, British Columbia or Montana (Stinson et. al., 2001).

Bald eagle nesting parameters in the Pacific Northwest include proximity to water with an adequate food source, large trees with sturdy branching at sufficient height for nesting, and stand heterogeneity both vertically and horizontally (Grubb, 1976). Nest tree structure is more important than tree species, and nest trees are typically among the largest in the stand providing an unobstructed view of an associated water body. Critical nesting activities generally fall between January 1, and August 31.

Wintering bald eagles concentrate in areas where food is abundant and disturbance is minimal (Rodrick and Milner, 1991). Because eagles often depend on dead or weakened prey, spawned salmon are often an important food source for wintering eagles. Rivers, streams and large lakes with spawning salmon and/or waterfowl concentrations are primary feeding areas for wintering bald eagles. Eagles typically perch near their food source during the day and prefer the tallest trees, which afford the best views. Deciduous and dead coniferous trees near the feeding area are preferred for diurnal bald eagle perching (Stalmaster and Newman, 1979). Evening roosts are generally established near the feeding area but may occur inland as well (Peterson, 1986). Wintering activities generally occur between mid-November and mid-March. .

Bald eagles are not known to nest within ten miles of the proposed project area. Bald eagles have attempted to nest along the Hanford Reach of the Columbia River approximately ten miles east of the proposed project area (USDOE, 2001). Wintering bald eagles are present along all segments, including the area north of Ellensburg near Wilson and Naneum creeks, in the YTC near Hanson and Alkali Canyon Creeks, and near the Columbia River crossings at the Vantage, Midway and Hanford Substations. No primary winter roost sites are known to exist within three miles of the proposed project area, although secondary roosts and ground perches have been identified around the area where Segments E and F cross the Columbia River into the Hanford Substation (USDOE, 2001). Surveys of potential winter roost sites will occur along the preferred alternative in winter 2002.

3.2.4.2 Sage Grouse

The sage grouse is a candidate for federal listing. The WDFW lists the sage grouse as Threatened. In Washington, sage grouse historically ranged from the Columbia River, north to Oroville, west to the foothills of the Cascades, and east to the Spokane River (Schroeder, et. al., 2000). The current Washington population of breeding sage grouse is estimated at approximately 1,000 birds roughly divided between two populations. One population of approximately 600 birds is located on mostly private lands in Douglas and Grant Counties, while the other approximately 400 birds exists in Kittitas and Yakima Counties on the YTC (Schroeder, et. al, 2000).

Sage grouse gather in the spring at specific locations, called leks, to perform courtship displays and mating. Leks are most commonly found in a barren area surrounded by sagebrush, but they have been found in a wide variety of open areas such as gravel pits, roads, buttes, dry lake beds and meadows (Hays, et. al., 1998). Nesting occurs in areas of medium to high shrub cover, often with dry grasses. Sage grouse consume sagebrush, grasses, forbs and some insects. Preferred winter habitats are tall dense stands of sagebrush, which provide shelter and forage (Hays, et. al., 1998). Winter sites often face south or west, since less snow generally accumulates in these orientations.

Within the proposed project area, sage grouse are known to exist within the YTC, including sections of Segments A, B_{north}, B_{south} and C. Sage grouse have been observed within each of the six drainages in the YTC the route passes through, and are known to nest in the Alkali Canyon and Corral Canyon drainages. A historic lek in the Johnson Creek drainage has not been used since 1987. Most of the core sage grouse habitat in the YTC is west of the proposed route. Historic sage grouse migration corridors exist along the top of the Saddle Mountains and along Cold Creek, although sage grouse have not been sighted in these areas recently.

3.2.4.3 Washington Ground Squirrel

The Washington ground squirrel was originally common in Washington and Oregon east and south of the Columbia River. Habitat loss and fragmentation has severely reduced its range, and it is listed as both a state and federal Species of Concern. The distribution of the squirrel in Washington has been reduced and become more fragmented in the last 10 years (Betts, 1999).

The Washington ground squirrel prefers a grass and forb dominated habitat with deep, weak soils (Betts, 1990). They feed mostly on grass and forbs, but may also eat bulbs, seed pods and insects. The preference for areas of grasses and forbs rather than brushy areas probably reflects habitat selection based on the total abundance of food sources (Betts, 1990) Washington ground squirrels generally live in colonies of up to 250 individuals.

Much of the proposed project is located west of the Columbia River, outside of the Washington ground squirrels known historic range. Washington ground squirrels most likely do not currently exist within the project area on the east side of the Columbia River, One historical occurrence (pre-1978) was noted near line segment F in the Saddle Mountains (Betts, 1990). An existing population was found on the Hanford Reach National Monument north of the crest of the Saddle Mountains approximately five miles east of Segment F (Nature Conservancy, 1999). This is the nearest known existing population of Washington ground squirrel to the project. Suitable Washington ground squirrel habitat exists within the project area east of the Columbia River especially near Crab Creek (Hill, 2001) and the Wahluke Slope (Nature Conservancy, 1999), but it is not known if these habitats are currently occupied.

3.2.4.4 Mardon Skipper

The Mardon skipper is a small species of butterfly that is a candidate for federal listing. The WDFW has listed it as Endangered. There are two generalized areas where the Mardon skipper occurs: the Puget Prairie area in Thurston and Pierce Counties, and the South Cascades area in Yakima and Klickitat Counties. Only nine of 18 historic sites are currently occupied with a total population of approximately 300 adults estimated in 1998 (Potter, et. al., 1999).

The habitat requirements of the South Cascades populations are generally open fescue grasslands within Ponderosa pine woodlands. Site conditions can range from dry open ridgetops to wetland and riparian areas. Females lay eggs on tufts of bunchgrass (including Idaho fescue), and the larvae feed on the bunchgrass for three or four months. Adults feed on the nectar of a variety of plants, including penstemon, sego lily, and wallflower (Potter, et. al., 1999).

The closest known location of historic and present Mardon skipper populations is approximately 50 miles southwest of the proposed project (Potter, et. al., 1999). The Ponderosa pine/fescue habitat type does not occur within the project area boundaries, although the habitat type may exist near the northern end of the project area. It is unlikely that the Mardon skipper exists within the project area.

3.2.5 Federal Species of Concern and State Listed Species

A list of state and federal listed wildlife species that are known to exist within the four counties crossed by the proposed project is presented in Table 3.2-1. The table indicates which of these species could possibly occur along each line segment.

Table 3.2-1 Possible Presence of State and Federal Listed Species Within Project Area.

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Document Occurrence Type
Birds				
Aleutian Canada goose	FT[1]	ST	B, D, E, F, G	M
Bald eagle	FT	ST	All segments	W
Golden eagle		SC	B, C, D, E, F, G	B
Ferruginous hawk	FSC	ST	All segments	B
Swainson's hawk		SM	All segments	B
Northern goshawk	FSC	SC	All segments	M
Peregrine falcon	FSC	SE	C, D, E, F	B
Swainson's hawk		SM	All segments	B
Osprey		SM	B, D, E, F, G	B
Prairie falcon		SM	All segments	B
Turkey vulture		SM	B, D, E, F, G	B
Prairie falcon		SM	C, D, E, F	B
Burrowing owl	FSC	SC	C, D, E, F	B
Northern Spotted Owl	FT	SE	None	N
Lewis' woodpecker		SC	A, C, D, E, F	B
Sage sparrow		SC	All segments	B
Sage thrasher		SC	All segments	B
Loggerhead shrike	FSC	SC	All segments	B
Long-billed curlew	FSC	SM	A, C, E, F	B
Western bluebird	FSC	SM	All segments	B
Ash-throated flycatcher	FSC	SM	None	N
Olive sided flycatcher	FSC		All segments	P
Little Willow flycatcher	FSC		All segments	P
Grasshopper sparrow	FSC	SM	C	B
Western sage grouse	FSC	ST	A, C, F	B
Sharp tailed grouse	FSC	ST	None	H
American white pelican		SE	B, D, E, F, G	M
Harlequin duck	FSC		B, D, E, F, G	P
Common loon		SS	B, D, E, F, G	M

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Document Occurrence Type
Marbled murrelet	FT	ST	None	N
Black tern	FSC	SM	B, D, E, F, G	M
Caspian tern		SM	B, D, E, F, G	M
Forster's tern		SM	B, D, E, F, G	M
Great blue heron		SM	B, D, E, F, G	B
Black-crowned night heron		SM	B, D, E, F, G	B
Mammals				
Gray wolf	FE	SE	None	N
Canada lynx	FT	ST	None	N
Grizzly bear	FT	SE	None	N
California bighorn sheep	FSC		B, D, E, F, G	P
Pacific fisher	FSC	SE	None	N
Wolverine	FSC	SC	None	N
Western gray squirrel	FSC	ST	None	N
Washington ground squirrel	FC	SC	D, E, F	H
Pygmy rabbit	FSC	SE	None	H
Ord's kangaroo rat		SM	B, D, E, F, G	P
Northern grasshopper mouse		SM	All segments	P
Sagebrush vole		SM	All segments	P
White-tailed jackrabbit		SC	All segments	B
Merriam's shrew		SC	All segments	B
Ord's kangaroo rat		SM	All segments	B
Potholes meadow vole	FSC		None	N
Sagebrush vole		SM	All segments	B
Pacific western big-eared bat	FSC	SC	All segments	P
Long-eared myotis	FSC	SM	All segments	P
Long-legged myotis	FSC	SM	All segments	P
Fringed myotis	FSC	SM	All segments	P
Western small-footed myotis	FSC	SM	All segments	P
Yuma myotis	FSC		All segments	P
Pallid bat		SM	All segments	P
Insects				
Mardon skipper	FC	SE	None	N
Persius' duskywing		SM	E	P
Reptiles & Amphibians				
Cascades frog	FSC		None	N
Larch Mountain salamander	FSC	SS	None	N
Northern leopard frog	FSC	SE	D, E, F	P
Red-legged frog	FSC		None	N
Tailed frog	FSC	SM	None	N
Columbia Spotted Frog	FSC	SE	All segments	P
Night snake		SM	B, D, E, F, G	P
Woodhouse's Toad		SM	E, F	B
Sagebrush lizard	FSC		All segments	B
Night snake		SM	All segments	B
Striped whipsnake		SC	All segments	B

Federal Status	State Status	Presence
FE = Endangered	SE = Endangered	P = Present (general presence)
FT = Threatened	ST = Threatened	B = Breeding
FC = Candidate	SS = Sensitive	M = Migrant
FSC = Species of Concern	SC = Candidate	W = Winter Resident
	SM = Monitor	N = Not Present
		H = Historically Present, Not Present Now

Note 1: To be delisted in 2001

3.3 Impacts to Wildlife Species and Habitat

Impacts to wildlife species and habitat are assessed for each alternative proposed for the project. Various segments described in Section 2.2.3 are combined to form each alternative.

3.3.1 Wildlife Species Impact Levels

Environmental impact levels to wildlife are defined in four categories:

High impacts would occur when an action creates a significant adverse change in wildlife habitat, populations, or individuals. High impacts may result from actions that:

- cause the take of a federally listed or proposed threatened or endangered wildlife species;
- cause a significant reduction in the population, habitat or viability of a federal or state listed wildlife species of concern or sensitive wildlife species, which would result in trends towards endangerment or the need for federal listing;
- cause a significant long-term (more than two years) reduction in the quantity or quality of habitat critical to the survival of local populations of common wildlife species; or
- harm or kill a significant number of individuals of a common wildlife species.

Moderate impacts would occur when an action creates a moderate adverse change in wildlife habitat, populations or individuals. Moderate impacts may result from actions that:

- create an effect on federally listed or proposed threatened or endangered wildlife species that could be partially mitigated;
- cause a reduction in the population, habitat or viability of a federal or state listed wildlife species of concern or sensitive wildlife species, without resulting in trends towards endangerment or the need for federal listing; or
- harm or kill a small number of individuals of a common wildlife species.

Low impacts would occur when an action creates a minor adverse change in wildlife habitat, populations or individuals. Low impacts may result from actions that:

- create an effect on federally listed or proposed threatened or endangered wildlife species that could be largely or completely mitigated (i.e., seasonal restrictions on construction activities) or are temporary and benign (i.e., temporary disturbance by construction noise);
- cause a minor short-term (less than two years) reduction in the quantity or quality of the habitat of a federal or state listed wildlife species of concern or sensitive wildlife species, without resulting in trends towards endangerment or the need for federal listing; or
- cause a significant short-term (less than two years) reduction in the quantity or quality of habitat critical to the survival of local populations of common wildlife species.

Minimal impacts would occur when an action creates a temporary or minor adverse change in wildlife habitat or individuals. Minimal impacts may result from actions that:

- cause a temporary (less than two weeks) disturbance or displacement of a federal or state listed wildlife species of concern or sensitive wildlife species; or
- cause a short-term (less than one year) disturbance or displacement of a common wildlife species.

No impacts would occur when an action has no effect or fewer impacts than the minimal impact level on wildlife habitat, populations or individuals.

3.3.2 Impacts to Wildlife Species Common to All Action Alternatives

The construction, operation and maintenance of the proposed transmission line would impact wildlife populations residing in or near the proposed study area. The extent of impact would depend on the species, habitat requirements, and availability of suitable habitat in and around the construction and ROW area.

3.3.2.1 Construction Impacts

Construction impacts can be generally categorized as short-term disturbances related to construction noise, dust, human intrusion, or long-term physical habitat changes or harm to individual animals.

Short-term construction disturbances, depending on the time of year and location, could impact a wide variety of species including mule deer, elk, wintering bald eagles, passerine bird species, waterfowl, raptors, small rodents and amphibian species. Nesting raptors are easily disturbed by construction noise and human presence, and may abandon their nests if the disturbance is severe. Short-term disturbance of a federally listed species may constitute a take, which is considered a high impact. However, with mitigation (e.g., construction timing restrictions), short-term construction-related disturbances would result in only low or minimal impacts to wildlife species.

Long-term construction impacts would mostly stem from habitat loss, due to clearing for ROW or roads. Clearing would mostly impact species that use shrub-steppe habitats, although some limited areas of riparian vegetation may need to be removed. Clearing would be required for tower sites, new substations, expanded substations and access roads. Most ROW areas not associated with towers, roads or substations would not need to be cleared, since the shrub-steppe vegetation generally does not grow high enough to exceed line clearance thresholds.

Areas cleared of shrub-steppe vegetation would most likely be invaded by non-native pioneer species, which would preclude the regrowth of native vegetation. In areas of relatively undisturbed, native shrub-steppe habitat, clearing would constitute a high impact, because high-value habitat for state or federally listed shrub-steppe-dependant species (e.g., sage grouse, sage sparrows, sage thrashers and loggerhead shrikes) would be reduced. In areas of degraded shrub-steppe vegetation (e.g., vegetation infested with weed species), clearing would constitute a moderate impact, since the habitat is already degraded. Clearing in areas previously cleared or severely disturbed (such as agricultural lands) would result in minimal impacts to wildlife species.

Clearing areas of native shrub-steppe vegetation, especially linear corridors such as roads can increase the risk of predation for shrub-steppe dependant small mammal, reptile and bird

species. With less cover available and an easy corridor for predators to travel into previously unbroken habitat, these species can be at increased risk of predation from coyotes, raptors and other predators (Brunkal, 2001). Species most susceptible to increased predation include jackrabbits, sagebrush voles, sagebrush lizards, striped whipsnakes, nightsnakes, and sage grouse.

Riparian areas are generally located in narrow strips along small streams and often in canyons. Since the proposed transmission line would either span these narrow areas or would be located upslope of stream channels, little or no riparian vegetation would need to be removed for transmission line clearance and tower construction. However, since riparian areas are extremely important wildlife habitat, clearing riparian vegetation for ROW or access road construction would cause moderate to high impacts to wildlife species by disrupting movement corridors, removing nesting or foraging habitat, and compacting stream banks.

3.3.2.2 Operation and Maintenance Impacts

Impacts to wildlife from the operation and maintenance of the proposed project are generally related to the temporary disturbance of wildlife (caused by maintenance equipment and human presence), or the physical presence of the structures.

3.3.2.2.1 Maintenance Impacts

Maintenance of the proposed project may include periodic vehicle and foot inspections, helicopter surveys, tower and line repair, clearing of ROW, and other disturbances. Depending on the time of year and the location, maintenance activities could impact a wide variety of species, including mule deer, elk, wintering bald eagles, passerine bird species, waterfowl, raptors, small rodents and amphibian species. Raptors frequently use transmission line towers for nesting and perch sites, and because the towers are the tallest part of the landscape, they may be the preferred hunting site for some species. Nesting raptors are easily disturbed by equipment noise and human presence and may abandon their nests if the disturbance is severe. Periodic ROW clearing would be limited to riparian areas, where the impact would be high.

3.3.2.2.2 Operation and Avian Collision Impacts

Operation of the proposed project would have the greatest impact on bird species, due to the collision threat posed by towers, transmission lines and grounding wires. Other wildlife species would not be significantly impacted, since the presence of the transmission lines, towers and access roads do not present barriers to migration, create excessive noise, or otherwise cause major behavior changes.

Some bird species, usually waterfowl, are prone to collisions with transmission lines, especially the grounding wires located at the top of the towers (Meyer, 1978, James and Haak, 1979, Beaulaurier, 1981, Beaulaurier et al., 1982, Faanes, 1987). Collisions usually occur near water or migration corridors and more often during inclement weather. Raptor species are less likely to collide with power lines, perhaps due to their excellent eyesight and tendency to not fly at dusk or in low visibility weather conditions (Olendorff and Lehman, 1986). Smaller migratory birds are at risk, but generally not as prone to collision because of their small size, their ability to quickly maneuver away from obstacles, and the fact that they often migrate high enough above the ground to avoid transmission lines. Permanent-resident birds that fly in tight flocks, particularly those in wetland areas, may be at higher risk than other species.

The following four factors influence avian transmission line collisions: the current level of risk, power line configuration, amount of bird use in a particular area, and the tendency of certain bird species to collide with wires.

The existing transmission lines that would be paralleled have a current level of risk for avian collisions. The risk would be less where a new transmission line parallels an existing transmission line. Although risks and mortality would increase in these areas, they wouldn't double since there would already be existing risk. Avian collision risk would be higher for a new transmission line corridor (Segments C and F).

The type and configuration of transmission lines is a factor that influences avian collisions. Generally, ground wires located above the transmission wires and towers cause the majority of the avian collision mortalities (Beaulaurier, 1981, Beaulaurier et al, 1982, James and Haak, 1979). Ground wires would be required on all the segments, due to the risk of lightning strikes, so the proposed line would contribute more to avian collisions than one without ground wires. Line markers have been shown to reduce the incidence of avian collisions (Beaulaurier, 1981, Avian Power Line Interaction Committee, 1994).

The amount of bird use is heaviest at the Columbia River crossings where large numbers of waterfowl congregate, and at Crab Creek where a series of wetlands and open water habitats occur. Segments C and D cross Cold Creek, which is one of the most important migration corridors in Washington for passerines, raptors and other upland bird species (Stepniewski, 1998). The remaining areas of each alternative are generally located in upland areas without large concentrations of birds and outside of major migration corridors.

The types of birds most likely to collide with transmission lines are waterfowl, such as ducks and geese, great blue herons, and birds that form tight flocks such as blackbirds. Raptor species generally do not collide with transmission lines, because they rarely fly in poor weather conditions, and have excellent vision. Migrating passerine species generally fly high enough to avoid transmission lines, however during periods of poor visibility such as storms or fog, they tend to fly lower and may be at risk of collision with transmission lines or towers. Towers with warning lights (e.g., those that may be placed near airports, river crossings or other areas where visual enhancement is necessary) tend to attract birds to them at night during periods of low visibility, and therefore may increase the risk of avian collisions during inclement weather.

Waterfowl and other large species associated with wetland or open water would be placed at a higher risk of collision with the proposed transmission lines at the Columbia River crossings of Segments B_{north}, B_{south}, D, E, and F, and the Crab Creek crossing of Segments D, E and F. Impact levels are expected to be moderate for waterfowl at these locations. Passerine species and other upland migrants would be placed at a higher risk of collision with the proposed transmission line on Segments C and D where they cross the Cold Creek corridor, particularly during poor weather conditions. Impact levels are expected to be moderate for upland bird species at these locations.

Transmission lines and towers provide a beneficial effect to some bird species, especially raptors. Transmission towers are the tallest structures in many areas of the shrub-steppe habitat of eastern Washington and as such, may provide the only suitable perching, roosting and nesting spots for some species. Red-tailed hawks, ferruginous hawks, and Swainson's hawks all utilize tower structures for hunting perches and may build nests in suitable locations. Existing towers have probably contributed to an increase in these species (Johnson and O'Neil, 2001).

Although raptor species may benefit from an increase in habitat from additional towers, the effect to small shrub-steppe dependant species such as jackrabbits, sagebrush voles, sagebrush lizards, striped whipsnakes, nightsnakes, and sage grouse could be detrimental. Increased numbers of predatory raptors coupled with an increase in cleared areas may cause additional predation on these species (Brunkal, 2001).

3.3.3 Impacts to Wildlife Species Specific to Each Action Alternative

Impacts to wildlife species are discussed below for each alternative route. Table 2.3-1 shows the amount of different land area types disturbed by the project for each segment, which gives an indication of overall impact to wildlife species.

Table 2.3-1 Disturbed Area Data

LANDUSE COVER TYPE	COVER TYPE (ACRES)						
	A	B_{north}	B_{south}	C	D	E	F
Commercial, Industrial or Transportation	1.94	0.09	0.09	0.43	1.76	0.26	0.68
Urban, or Recreational Grasses				0.29			
Low Intensity Residential					0.32	0.17	
Deciduous Forest	1.49			2.72	0.29		
Evergreen Forest	3.43				0.14	0.44	
Mixed Forest	0.15				0.22		
Grasslands or Herbaceous Vegetation	12.89	26.17	26.66	106.98	25.92	34.14	58.33
Shrubland	195.36	56.26	63.76	316.50	36.18	112.38	172.97
Pasture/Hay	1.19				17.14	29.95	2.63
Fallow	2.46				0.29	0.17	
Orchard, Crops or Grains	0.30				1.25		
Row Crops					13.05	21.13	0.30
Woody Wetlands				0.29			
Bare Rock, Sand, or Clay				0.29		1.14	1.65
Unknown					0.07	0.44	
Total Acres	**219.21**	**82.52**	**90.51**	**427.50**	**96.63**	**200.22**	**236.56**

3.3.3.1 Alternative 1- Schultz-Hanford (Segments A, B_{north} or B_{south}, E)

3.3.3.1.1 Segment A

Segment A would require approximately 208 acres of shrub-steppe and grassland vegetation to be cleared for tower sites and access road construction and approximately 5 acres of forests. Nesting habitat for sagebrush obligate species such as the sage sparrow and sage thrasher would be removed, as would known nesting habitat for long-billed curlew (moderate impact). Sharp-tailed grouse have been documented in the past near the west end of Segment A, and if they still exist, would be moderately impacted by vegetation removal. Sage grouse are known to exist in the southern end of this segment, although no occurrences have been documented closer than one mile from the proposed ROW. Disturbance to sage grouse from vegetation removal and construction noise may result from this project (moderate to high impact). The increase in risk to raptors, waterfowl and passerine bird species from collision with transmission lines and towers would be low, since no major migration corridors or bodies of water are located along this segment (minimal impact). However, the increase in potential habitat for perching raptors may cause an increase in predation risk for shrub-steppe dependant animals, a moderate risk. If the project were constructed during the winter, the potential for disturbing roosting bald eagles (threatened species) would be high near the Wilson and Naneum Creek crossings (high impact). Also, wintering deer and elk might be temporarily disturbed by construction noise and activity (minimal impact).

3.3.3.1.2 Segments B_{north} and B_{south}

Segment B_{north} would require approximately 82 acres of shrub-steppe and grassland vegetation to be cleared for tower sites and access road construction, while Segment B_{south} would require approximately 90 acres of clearing. If the project were constructed during the winter, the potential for disturbing roosting bald eagles would be high near the Columbia River crossing

(high impact). In the upland areas, wintering deer and elk might be disturbed by construction activity (minimal impact). Sage grouse are known to exist near the western end of these segments and might be impacted (moderate to high impact). Night snakes have been observed near the proposed ROW and might be impacted (minimal impact). Near the Columbia River, waterfowl, pelicans and other birds using the area as a migration corridor might be at increased risk of collision with the transmission line spanning the river (moderate impact).

3.3.3.1.3 Segment E

Segment E would require that approximately 146 acres of shrub-steppe and grassland habitat would need to be cleared for tower sites and access roads. Segment E crosses Crab Creek and the Columbia River, which are both migration corridors for birds and areas of high waterfowl concentrations. The risk of avian collisions would be increased in these areas, although the proposed line would be located adjacent to an existing line (moderate impact).

The habitat in the area between the Vantage Substation Crab Creek is mostly shrub-steppe vegetation. Disturbance of this area would cause moderate impacts to shrub-steppe habitat and shrub-steppe dependant species. Nightsnakes and striped whipsnakes have been documented near the ROW and could be disturbed or harmed (a moderate impact).

The Saddle Mountains have documented occurrences of nesting prairie falcons and golden eagles that could be disturbed by construction activities (low to moderate impact). Other species in the Saddle Mountains include the striped whipsnake, chukar, passerine bird species, and a variety of small mammals. Impacts to these species would be moderate, due to the removal of shrub-steppe and dwarf shrub-steppe plant communities.

The area immediately south of the Saddle Mountain crest has not been converted to agriculture. Shrub-steppe-dependant species in this area would be moderately impacted. The line crosses the remainder of the Wahluke Slope over mostly agricultural lands that have little native shrub-steppe habitat present. Construction and operation of the project in this section of the proposed segment would have no impact on species that depend on shrub-steppe habitat, and minimal to no impact on other wildlife species. The project may have a low positive impact for raptor species due to an increase in nesting, perching and roosting habitat. However, the additional habitat available for perching raptors could increase the predation risk for small shrub-steppe dependant species such as sage sparrows, sage thrashers, mice and voles, a moderate impact.

The shrub-steppe habitat in the Hanford Site is relatively undisturbed, although invasive species are present due to past grazing practices. A herd of mule deer, uncommon in the central shrub-steppe region, is present in this area and may be disturbed by construction activity (low impact). Shrub-steppe-dependant species such as the sage sparrow would be disturbed by construction and habitat removal during clearing (moderate impact). Burrowing owls have been documented near the proposed line and may be impacted by clearing and construction (moderate impact). Raptors (including Swainson's hawks) are present. The project might have a low positive impact for raptors, since the towers are the tallest structures within many miles and make excellent perching, roosting and nesting habitat.

A large wetland complex called Saddle Mountain Wasteway, just west of Segment E, is home to a large numbers of waterfowl, great blue herons and other wetland species. The project would cross a channel and the associated wetland complex leading east from the lake. Woodhouse's toads have been documented in great numbers within this area and might be impacted (low impact). The proposed line would avoid the riparian area (minimal impact to riparian species),

but add an additional line that would increase the collision hazard for waterfowl and other bird species (moderate impact). The crossing over the Columbia River into the Hanford Substation would also increase the collision hazard for waterfowl and other bird species using the migration corridor (moderate impact).

3.3.3.2 Alternative 1A Schultz-Hanford (Segments A, B_{north} or B_{south}, F)

Impacts to wildlife and wildlife habitat along Segments A and B_{north} or B_{south} would be the same as described for Alternative 1, (see Sections 3.3.3.1.1 and 3.3.3.1.2.)

3.3.3.2.1 Segment F

Segment F would require clearing of 231 acres of shrub-steppe and grassland vegetation. Impact levels in the area between the Vantage Substation and the crest of the Saddle Mountains would be similar to those described for Segment E. South of the crest of the Saddle Mountains, the area is relatively undisturbed, with the exception of historic grazing and some motorized recreation activities. An historic sage grouse sighting was made near the study area, and a possible historic (pre-1978) Washington ground squirrel colony was located in the general vicinity of the proposed project. The top of the Saddle Mountains is an historic sage grouse corridor. If either of these species are still present, construction and clearing of the project would cause a high impact to them.

From the Saddle Mountains, Segment F cuts south across the Wahluke Slope. This section of the Wahluke Slope is not used for agriculture and is relatively undisturbed shrub-steppe habitat. Swainson's hawks are known to nest along this section and might be positively impacted by construction and operation of the project (low positive impact). Other shrub-steppe-dependant wildlife species would be moderately impacted by removal of shrub-steppe vegetation during tower placement and road clearing.

After crossing Highway 24, Segment F enters the Hanford Site. The impacts to wildlife in this area would be similar to those impacts associated with Segment E.

3.3.3.3 Alternative 2 Schultz-New Wautoma Substation (Segments A, B_{north} or B_{south}, D)

Impacts to wildlife and wildlife habitat along Segments A and B_{north} or B_{south} would be the same as described for Alternative 1 (see Sections 3.3.3.1.1 and 3.3.3.1.2).

Segment D has the most varied terrain, and thus the most diverse group of habitats of all the proposed segments. Approximately 62 acres of shrub-steppe and grassland habitat would need to be cleared for tower sites and access roads. Segment D crosses Crab Creek and the Columbia River, which are both migration corridors for birds and areas of high waterfowl concentrations. The risk of avian collisions would be increased in these areas, although the proposed line would be located adjacent to an existing line (moderate impact). The Saddle Mountains have documented occurrences of nesting prairie falcons and golden eagles that could be disturbed by construction activities (low to moderate impact). Other species in the Saddle Mountains include the striped whipsnake, chukar, passerine bird species, and a variety of small mammals. Impacts to these species would be moderate, due to the removal of shrub-steppe and dwarf shrub-steppe plant communities.

Segment D crosses the Wahluke Slope over mostly agricultural lands, with no native shrub-steppe habitat present. Construction and operation of the project in this section of the proposed segment would have no impact on species that depend on shrub-steppe habitat and would have minimal to no impact on other wildlife species.

The southern third of Segment D crosses the Columbia River and climbs over Umtanum Ridge. On the steep north face of Umtanum Ridge, nesting prairie falcons and other raptor species have been documented. Construction in this area would cause low to moderate impacts. Swainson's hawks, loggerhead shrikes, and burrowing owls have all been documented nesting near or on the proposed ROW south of Umtanum Ridge. Clearing in this area would cause moderate to high impacts to burrowing owls (depending on tower and road placement) and moderate impacts to other shrub-steppe-dependant species. In addition, the southern end of the proposed line crosses the Cold Creek wildlife migration corridor, which is one of the most important bird migration corridors in Washington and an important corridor for wildlife migrating between the YTC and the Hanford Site. Disturbance to this area could disrupt the migration patterns of these species and increase the hazard of avian collisions with transmission lines and towers (moderate impact).

3.3.3.4 Alternative 3 Schultz-New Wautoma Substation YTC Route (Segments A, C)

Impacts to wildlife and wildlife habitat along Segment A would be the same as described for Alternative 1, see Section 3.3.3.1.1.

Segment C would require approximately 423 acres of shrub-steppe and grassland vegetation and 3 acres of forested land to be cleared for tower sites and access roads. Sage grouse, burrowing owls, wintering bald eagles, and loggerhead shrike are all known to be present near the proposed ROW, and would be impacted by habitat removal and disturbance (high impact). The southern end of the segment crosses Cold Creek, which one of the most important bird migration corridors in Washington. The southern portion is also an important area for deer, elk, coyote, jackrabbit and other species migrating between the YTC and the Hanford Site. Disturbance to this area could disrupt the migration patterns of these species, and increase the hazard of avian collisions with transmission lines and towers (moderate impact).

3.3.3.5 No Action Alternative

The no action alternative would not change any existing conditions, and therefore would have no impact on wildlife species.

3.3.4 Impacts to Threatened and Endangered Wildlife Species

This section describes the impacts that the proposed project would have on the four wildlife species that are either federally listed or proposed for listing: the bald eagle, sage grouse, Washington ground squirrel and the Mardon skipper. A Biological Assessment is being prepared separately, and a determination of the effects for each of these species will be presented in that document.

3.3.4.1 Bald Eagle

Bald eagles are not known to nest within the study area. Wintering bald eagles are present along all segments, including the area north of Ellensburg near Wilson and Naneum creeks, in the YTC near Hanson and Alkali Canyon Creeks, and near the Columbia River crossings at the Vantage, Midway and Hanford Substations. Construction near known bald eagle roost sites might disturb wintering bald eagles (high impact). In areas away from roost sites, the disturbance of bald eagles from construction will result in a minimal impact. It is unlikely that eagle habitat would be removed. With mitigation, the proposed project would have no impact on bald eagles.

3.3.4.2 Sage Grouse

The sage grouse is a candidate for federal listing. The Washington Department of Fish and Wildlife (WDFW) lists the sage grouse as threatened. In Washington, sage grouse have historically ranged from the Columbia River, north to Oroville, west to the foothills of the Cascades, and east to the Spokane River. Within the proposed study area, they are known to exist within each of the six drainages in the YTC that are crossed by sections of Segments A, B_{north}, B_{south} and C. Sage grouse are known to nest in the Alkali Canyon and Corral Canyon drainages. A historic lek in the Johnson Creek drainage has not been used since 1987. Most of the core sage grouse habitat in the YTC is west of the proposed route. Historic sage grouse migration corridors exist along the top of the Saddle Mountains and along Cold Creek, although they have not been sighted in the Saddle Mountain area recently. Construction of Segments A, B_{north}, B_{south} and C and would cause a high impact to sage grouse. Construction of Segments D, E, and F would cause a low impact. With mitigation, construction of Segments A, B_{north}, B_{south} or C would cause a moderate impact to sage grouse. With mitigation, construction of all other segments would cause a low impact.

3.3.4.3 Mardon Skipper

The closest known location of historic and current Mardon skipper populations is approximately 50 miles southwest of the proposed project. The Ponderosa pine/fescue habitat type does not occur within the study area boundaries, although this habitat type may exist near the northern end of the study area. The project would have no impact on the Mardon Skipper.

3.3.4.4 Washington Ground Squirrel

The Washington ground squirrel is listed as both a state and federal species of concern. Much of the proposed project is located west of the Columbia River, outside of the Washington ground squirrels' known historic range. Washington ground squirrels probably do not currently exist within the study area on the east side of the Columbia River. One historical occurrence (pre-1978) was noted near line Segment F in the Saddle Mountains (Betts, 1990). The nearest known existing population is approximately 15 miles east of line Segment F. Suitable Washington ground squirrel habitat may exist within the proposed study area east of the Columbia River, especially near Crab Creek (Hill, 2001). If Washington ground squirrel colonies exist within or adjacent to the proposed study area, construction of the project would cause a high impact. If no colonies exist, the project would have no impact. With mitigation, the proposed project would have a moderate or low impact on any Washington ground squirrel colonies that might exist within the proposed study area.

3.3.5 Impacts to Special Status Wildlife Species

Table 2.3-2 lists state and federal special status species that may be present within each segment of the proposed study area and indicates the possible impact the project may have on them.

Table 2.3-2 Impacts to Special Status Species

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Birds						
Aleutian Canada goose	FT[1]	ST	B_{north}, B_{south}, D, E, F	M	M	M
Bald eagle	FT	ST	All Segments	W	H	L
Golden eagle		SC	B_{north}, B_{south}, C, D, E, F	B	M	L
Ferruginous hawk	FSC	ST	All Segments	B	M	L
Swainson's hawk		SM	All Segments	B	M	L
Northern goshawk	FSC	SC	All Segments	M	N	N
Peregrine falcon	FSC	SE	C, D, E, F	B	L	L
Swainson's hawk		SM	All Segments	B	M	Mn
Osprey		SM	B_{north}, B_{south}, D, E, F	B	L	Mn
Prairie falcon		SM	All Segments	B	M	Mn
Turkey vulture		SM	B_{north}, B_{south}, D, E, F	B	L	Mn
Burrowing owl	FSC	SC	C, D, E, F	B	H	M
Northern Spotted Owl	FT	SE	None	N	N	N
Lewis' woodpecker		SC	A, C, D, E, F	B	M	L
Sage sparrow		SC	All Segments	B	H	M
Sage thrasher		SC	All Segments	B	H	M
Loggerhead shrike	FSC	SC	All Segments	B	M	M
Long-billed curlew	FSC	SM	A, C, E, F	B	H	M
Western bluebird	FSC	SM	All Segments	B	M	M
Ash-throated flycatcher	FSC	SM	None	N	N	N
Olive sided flycatcher	FSC		All Segments	P	M	L
Little Willow flycatcher	FSC		All Segments	P	M	L
Grasshopper sparrow	FSC	SM	C	B	M	M
Western sage grouse	FSC	ST	A, C, F	B	H	M
Sharp tailed grouse	FSC	ST	None	H	N	N
American white pelican		SE	B_{north}, B_{south}, D, E, F	M	M	M
Harlequin duck	FSC		B_{north}, B_{south}, D, E, F	P	M	M
Common loon		SS	B_{north}, B_{south}, D, E, F	M	M	M
Marbled murrelet	FT	ST	None	N	N	N
Black tern	FSC	SM	B_{north}, B_{south}, D, E, F	M	M	M
Caspian tern		SM	B_{north}, B_{south}, D, E, F	M	M	M
Forster's tern		SM	B_{north}, B_{south}, D, E, F	M	M	M
Great blue heron		SM	B_{north}, B_{south}, D, E, F	B	M	M
Black-crowned night heron		SM	B_{north}, B_{south}, D, E, F	B	M	M
Mammals						
Gray wolf	FE	SE	None	N	N	N
Canada lynx	FT	ST	None	N	N	N
Grizzly bear	FT	SE	None	N	N	N
California bighorn sheep	FSC		B_{north}, B_{south}, D, E, F	P	L	L
Pacific fisher	FSC	SE	None	N	N	N
Wolverine	FSC	SC	None	N	N	N
Western gray squirrel	FSC	ST	None	N	N	N
Washington ground squirrel	FC	SC	D, E, F	H	H	M-N
Pygmy rabbit	FSC	SE	D, E, F	H	H	M-N
Ord's kangaroo rat		SM	B_{north}, B_{south}, D, E, F	P	M	L

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Northern grasshopper mouse		SM	All Segments	P	H	M
Sagebrush vole		SM	All Segments	P	H	M
White-tailed jackrabbit		SC	All Segments	B	H	M
Merriam's shrew		SC	All Segments	B	H	M
Potholes meadow vole	FSC		None	N	N	N
Pacific western big-eared bat	FSC	SC	All Segments	P	M	M
Long-eared myotis	FSC	SM	All Segments	P	M	M
Long-legged myotis	FSC	SM	All Segments	P	M	M
Fringed myotis	FSC	SM	All Segments	P	M	M
Western small-footed myotis	FSC	SM	All Segments	P	M	M
Yuma myotis	FSC		All Segments	P	M	M
Pallid bat		SM	All Segments	P	M	M
Insects						
Mardon skipper	FC	SE	None	N	N	N
Persius' duskywing		SM	E	P	Mn	Mn
Reptiles & Amphibians						
Cascades frog	FSC		None	N	N	N
Larch Mountain salamander	FSC	SS	None	N	N	N
Northern leopard frog	FSC	SE	D, E, F	P	Mn	Mn
Red-legged frog	FSC		None	N	N	N
Tailed frog	FSC	SM	None	N	N	N
Spotted Frog	FC	SE	All Segments	P	Mn	Mn
Woodhouse's Toad		SM	E, F	B	Mn	Mn
Sagebrush lizard	FSC		All Segments	B	H	M
Night snake		SM	B_{north}, B_{south}, D, E, F	P	H	M
Striped whipsnake		SC	All Segments	B	H	M

Federal Status
FE = Endangered
FT = Threatened
FC = Candidate
FSC = Species of Concern

State Status
SE = Endangered
ST = Threatened
SS = Sensitive
SC = Candidate
SM = Monitor

Presence
P = Present
B = Breeding
M = Migrant
W = Winter Resident
N = Not Present
H = Historically Present, Not Currently Present

Impact
H = High
M = Moderate
L = Low
Mn = Minimal
N = None

3.3.6 Cumulative Impacts to Wildlife Species

The following discussion of cumulative impacts takes into account the linear nature of the proposed route, and any impacts that the proposed project would have on wildlife resources. The proposed project could potentially impact existing environmental conditions of current concern in eastern Washington, especially from the loss and fragmentation of native shrub-steppe plant and dependant wildlife communities.

The shrub-steppe habitat type has been significantly reduced from historic levels in Washington, and much of the remaining habitat is heavily disturbed by grazing, fire, or other land uses. It is generally recognized that preserving large, unbroken tracts of high-quality shrub-steppe vegetation is important for maintaining populations of shrub-steppe dependant species such as

sage grouse, sage sparrow, Washington ground squirrel and others (Johnson and O'Neil, 2001).

Construction of towers and access roads through shrub-steppe vegetation would increase the existing levels of habitat fragmentation and reduce the amount of shrub-steppe vegetation available for wildlife habitat. Over time, native shrub-steppe vegetation may recolonize the disturbed areas. However, construction of the proposed project would increase the potential for the linear spread of noxious weeds into previously undisturbed areas. The presence of noxious weeds makes the recolonization of disturbed areas with native vegetation extremely difficult, and generally leads to a long-term reduction in quality wildlife habitat.

Overall, the loss and fragmentation of additional shrub-steppe, grassland and riparian habitat from the proposed project, when added to the existing severe decline of these habitats from industry, road building, agriculture, grazing, military maneuvers, fires and other human-caused disturbance, will contribute cumulatively to a decrease in the amount and productivity of native wildlife habitat. Future transmission lines, road building, agricultural conversion of shrub-steppe and other foreseeable projects will compound this problem.

3.4 Recommended Wildlife Species Mitigation Measures

To reduce the impacts to wildlife associated with the construction, operation and maintenance of the proposed project, a number of mitigation measures would be implemented.

3.4.1 Big Game Disturbance

- Avoid construction on designated portions of Segments A, E, and F during extreme winter weather or unusually heavy snow accumulations, when big-game species are less mobile and more vulnerable to disturbance.

- Coordinate with WDFW to ensure that construction does not significantly interfere with big game wintering or migration.

- Gate and sign new or existing roads to prevent human encroachment into big game wintering areas or significant migration corridors.

3.4.2 Avian Collision Mitigation

- Where possible, line up new structures with existing structures to minimize vertical separation between sets of transmission lines.

- Install appropriate line markers in high risk areas, such as crossings of the Columbia River, Crab Creek, the Cold Creek migration corridor and high ridge crossings such as Saddle Mountains, Umtanum Ridge and Yakima Ridge.

- Monitor potential problem areas after construction to ensure that line markers are functioning properly, and identify any new areas that might require line markers.

- If possible, reduce or eliminate warning lights on towers.

3.4.3 Raptor Disturbance Mitigation

- Prior to initiating ground disturbing activities identify active raptor nest sites by consulting with WDFW and USFWS and conducting raptor nesting surveys if required.

- Time project construction to avoid the critical nesting periods, as determined by USFWS and WDFW.

- Time project construction to avoid disturbing wintering bald eagles. Perennial stream and river crossings and the areas one mile on either side of these crossings should be avoided from early November through mid-March. Known eagle wintering locations include Wilson and Naneum Creeks, which are all Columbia River crossings and perennial creeks in the YTC.

3.4.4 Shrub-Steppe Habitat Loss Mitigation

- Minimize the construction area to the extent possible at tower sites. Install construction "envelopes": silt fencing or other barrier materials surrounding the construction site to prevent vehicle turnaround, materials storage, or other disturbance outside the designated construction area.

- Do not clear vegetation for temporary vehicle travel or equipment storage. Crushing vegetation is preferable to removing it.

- When possible, avoid the use of access roads in steep terrain during unusually wet or muddy conditions or extremely dry conditions.

- Prevent the spread of noxious weeds by revegetating disturbed areas using native seed mix as soon as conditions permit.

- Carry fire fighting equipment in all vehicles and observe seasonal fire restrictions on construction. Park vehicles in areas free from dry grass or other vegetation.

3.4.5 Wildlife Disturbance Mitigation

- Prior to initiating ground-disturbing activities, identify areas of important wildlife populations or colonies such as burrowing owls, sage grouse leks, ground squirrels and other small animal species by consulting with WDFW and USFWS and conducting surveys if required.

- If possible, avoid locating towers, roads, construction staging areas, substations, or other disturbances in known colonies of small animal species.

- Gate and sign new or existing roads to prevent human encroachment into areas containing significant wildlife populations or relatively undisturbed wildlife habitat.

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